BlackDiamond® 20808 Switch Hardware Installation Guide

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Preface

This preface provides an overview of this guide, describes guide conventions, and lists other publications that might be useful.

WARNING!

Only trained service personnel should perform service to Extreme Networks switches and their components. Before installing or removing any components of the system, or before carrying out any maintenance procedures, you must thoroughly read the safety information provided in Appendix A of this guide. Failure to follow this safety information can lead to personal injury or damage to the equipment.

About this Guide

This guide provides the instructions and supporting information needed to install the Extreme Networks® BlackDiamond® 20808 switch. The guide provides information about site preparation, switch hardware features, and switch operation.

This guide is intended for use by network administrators responsible for installing and setting up network equipment. It assumes a basic working knowledge of:

- Local area networks (LANs)
- Ethernet concepts
- Ethernet switching and bridging concepts
- Routing concepts
- Simple Network Management Protocol (SNMP)

See the *ExtremeXOS 12.2 Concepts Guide* and the *ExtremeXOS 12.2 Command Reference Guide* for information about configuring Extreme Networks BlackDiamond 20808 switches.

NOTE

If the information in the installation note or release note shipped with your Extreme Networks switch differs from the information in this guide, follow the installation or release note.

Conventions

Table 1 and Table 2 list conventions used in Extreme Networks documentation.

Table 1: Notice Icons

Icon	Notice Type	Alerts you to...
	Note	Important features or instructions.
	Caution	Risk of personal injury, system damage, or loss of data.
	Warning	Risk of severe personal injury.

Table 2: Text Conventions

Convention	Description
`Screen displays`	This typeface represents information as it appears on the screen, or command syntax.
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says "type."
[Key] names	Key names appear in text in one of two ways: • Referenced by their labels, such as "the Return key" or "the Escape key" • Written with brackets, such as [Return] or [Esc] If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press [Ctrl]+[Alt]+[Del].
Words in italicized type	Italics emphasize a point of information or denote new terms at the place where they are defined in the text. Italics also indicate titles of books and other publications.

Related Publications

The Extreme Networks ExtremeXOS® switch documentation set includes:

- *BlackDiamond 20808 Switch Hardware Installation Guide* (this guide)
- *ExtremeXOS 12.2 Concepts Guide*
- *ExtremeXOS 12.2 Command Reference Guide*
- *ExtremeXOS 12.2 Release Notes*
- *BlackDiamond 8800 Series Switches Hardware Installation Guide*
- *BlackDiamond 10808 Switch Hardware Installation Guide*
- *BlackDiamond 12800 Series Switches Hardware Installation Guide*
- *Summit Family Switches Hardware Installation Guide*
- *Extreme Networks Pluggable Interfaces Hardware Installation Guide*

Documentation for Extreme Networks products is available from the Extreme Networks website at the following location:

http://www.extremenetworks.com/services/documentation

You can select and download the following Extreme Networks documentation from the Documentation Overview page:

- Software user guides
- Hardware user guides

Archived user guides for software are available at:

http://www.extremenetworks.com/services/documentation/swuserguides.asp

Archived installation guides for hardware are available at:

http://www.extremenetworks.com/services/documentation/hwuserguides.asp

1 About the BlackDiamond 20808 Switch

1 About the BlackDiamond 20808 Switch

This chapter includes the following sections:

For information about the I/O modules, management modules (MMs), and switch fabric modules (XFMs) for the BlackDiamond 20808 switch, see Chapter 2, "BlackDiamond 20808 Switch Modules.".

For information about installing the BlackDiamond 20808 switch, see Chapter 3, "Installing the BlackDiamond 20808 Chassis.".

Overview of the BlackDiamond 20808 Switch

The BlackDiamond switches are chassis-based, Ethernet service core switches designed for core applications. For more information about configuring a BlackDiamond switch, see the *ExtremeXOS 12.0 Concepts Guide* and the *ExtremeXOS 12.0 Command Reference Guide*.

The features of these switches include:

- I/O modules that are hot-swappable and include Gigabit Ethernet fiber ports (SFP), or 10-Gigabit Ethernet ports (XFP)
- Up to 64 line-rate 10- Gigabit Ethernet ports in one chassis
- Redundant management modules that provide the CPU control subsystem
- Redundant switch fabric modules that provide the active switching fabric
- Redundant, load-sharing, hot-swappable power supplies
- Redundant field-replaceable, hot-swappable fan trays
- Auto-negotiation for half-duplex or full-duplex operation on 10/100/1000 Mbps ports
- Load sharing on multiple ports
- 120 Gbps switch fabric capacity per I/O module

BlackDiamond 20808 Chassis

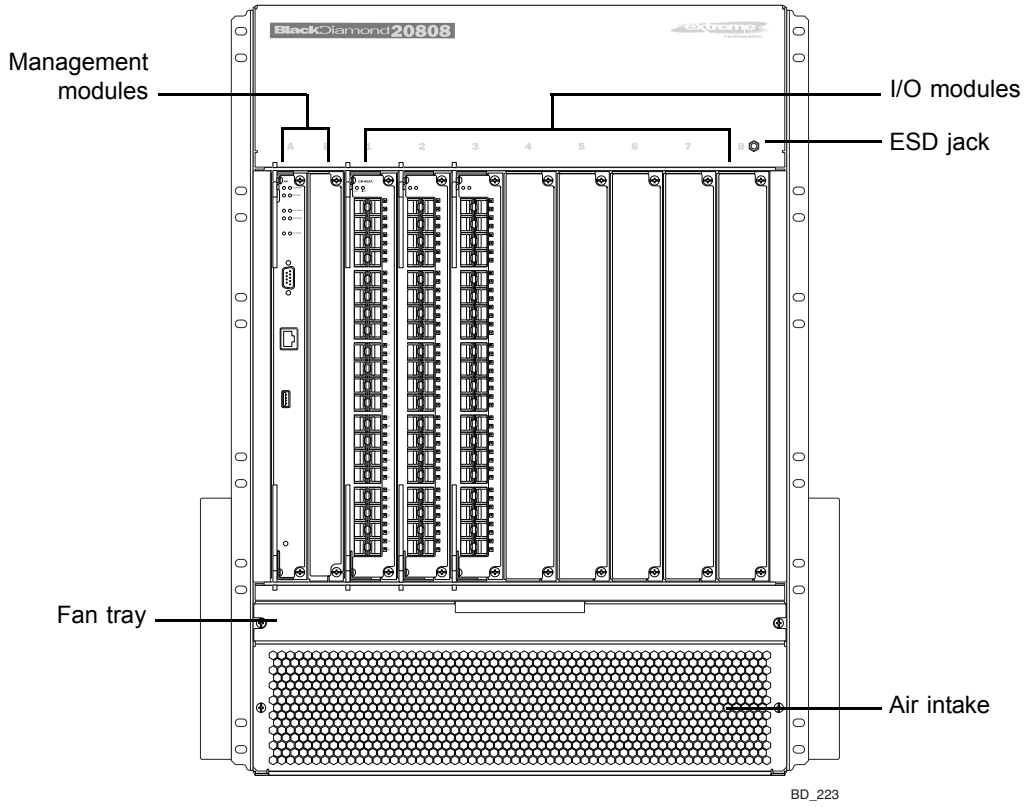
The BlackDiamond 20808 switch chassis has the following physical features:

- Height of 14.5 RU, allowing three switches to be installed in a 7-foot rack
- Optional mid-mount brackets for flexibility in rack positioning
- Ten vertical module slots in the front:
  - Two dedicated management module slots, labeled A and B
  - Eight I/O module slots, labeled 1 through 8
- Five horizontal chassis slots in the back for switch fabric modules

- Five bays for redundant AC or DC power supplies, accessible from the back
- Two fan trays:
  - One under the front card cage and accessible from the front
  - One above the switch fabric modules and accessible from the back
- Two connectors for an ESD-preventive wrist strap:
  - One at the top right corner of the front panel
  - One above the right side of the switch fabric modules
- Air filters for the chassis air intake and for the switch fabric modules

Figure 1 shows the front of a BlackDiamond 20808 chassis equipped with management modules and I/O modules.

Figure 1: Front of the BlackDiamond 20808 Chassis

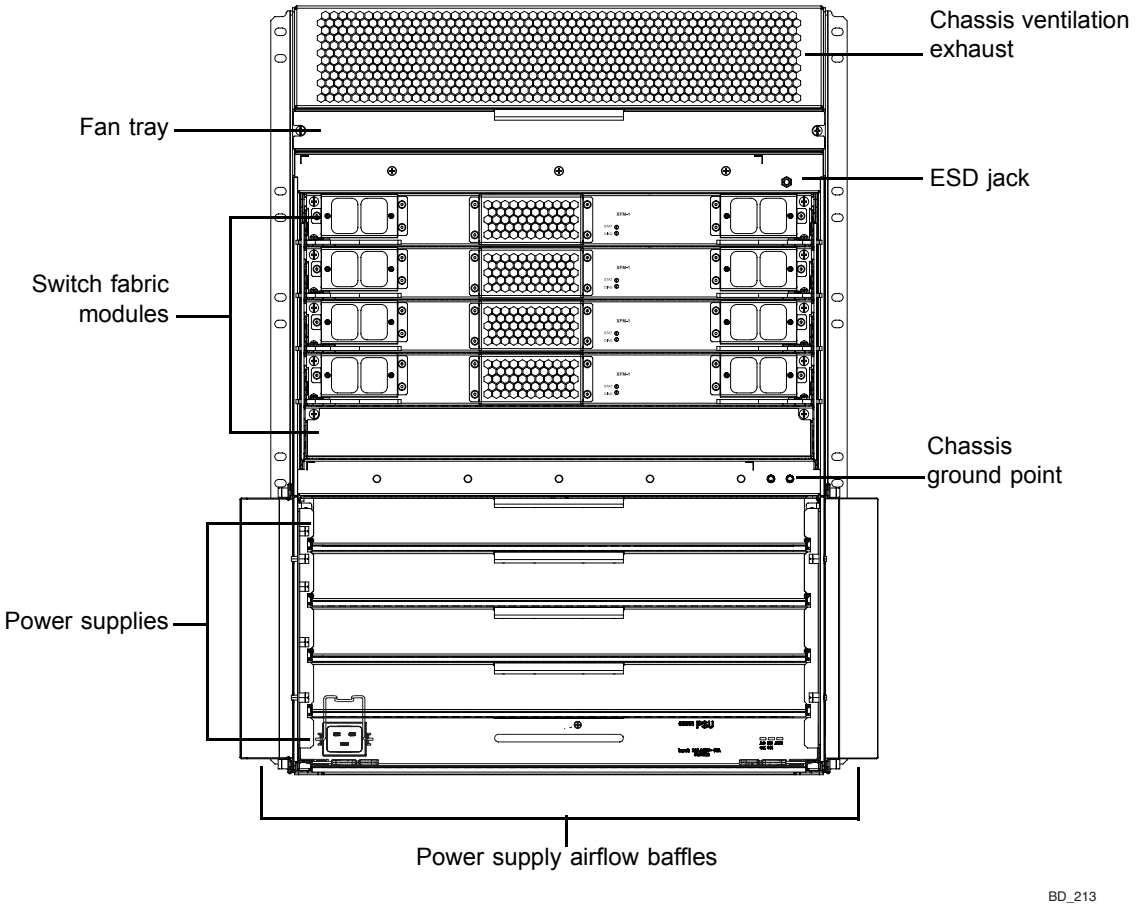


The front of the chassis provides access to:

- Card cage for the management modules and I/O modules
- Air intake vent with filter
- Fan tray with 12 fans
- Connection point for ESD-preventive strap

Figure 2 shows the back of the BlackDiamond 20808 chassis.

Figure 2: Back of the BlackDiamond 20808 Chassis



The back of the BlackDiamond 20808 chassis provides access to:

- Five installation bays for AC or DC power supplies
- Five horizontal slots for switch fabric modules
- Fan tray with 12 fans
- Chassis cooling air exhaust vent
- Connection point for ESD-preventive strap
- Attachment point for optional chassis ground
- Airflow baffles for power supply ventilation
- Chassis serial number
- Ethernet MAC address of the switch
- Symbols of safety certification

2 BlackDiamond 20808 Switch Modules

This chapter includes the following sections:

Overview of the BlackDiamond 20808 Modules

Modules for the BlackDiamond 20808 switch include management modules, I/O modules, and switch fabric modules.

Each module for the BlackDiamond 20808 switch consists of a printed circuit board mounted on a metal panel that acts as the insertion vehicle in the switch. The module carrier also includes ejector/injector levers and captive retaining screws at each end of the module front panel.

Table 3 lists the module types and models available for the BlackDiamond 20808 switch.

Table 3: Modules for the BlackDiamond 20808 Switch

Type	Model
Management module	MM-Base
	MM-Adv
Switch fabric module	XFM-1
I/O module	XM-8XB
	GM-40XB
	GM-40XA

Management Modules

Two BlackDiamond 20808 management modules are available, the MM-Base and the MM-Adv. The MM-Adv management modules support larger MAC address, IP route, and ACL capacity than the MM-Base. Management modules provide the CPU control subsystem for the switch.

The BlackDiamond 20808 switch has two dedicated management module slots, labeled A and B. One management module is required for switch operation; however, adding a second management module increases system availability through redundancy. Each management module contains a temperature sensor, nonvolatile random-access memory (NVRAM), and a real-time clock.

Redundant Management Module Activity

The BlackDiamond 20808 switch can operate with a single management module installed, providing full bandwidth with this single management module. When you install a second management module, one of the management modules operates as the primary, and the other becomes the secondary or backup.

The primary management module is responsible for upper-layer protocol processing and system management functions. The management modules in the BlackDiamond 20808 switch are not load sharing. One management module handles packets while the other is idle.

When you save the switch configuration, it is saved to all management modules.

Selection of the primary management module occurs automatically. The following examples describe the selection process:

- When a BlackDiamond 20808 switch boots with two management modules installed, the management module in slot A becomes the primary.

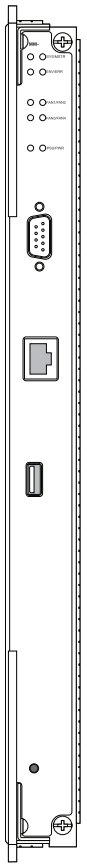
  If a switch is operating with one management module and a second management module is added to the switch after it has been powered up, the added management module becomes the secondary. Management modules that operate as secondary, or backup, management modules can be inserted and removed without disrupting network services.
- If you remove the primary management module while the switch is operating, the secondary management module performs a soft reset and then becomes the primary management module.

  For example, if you have a BlackDiamond 20808 switch with a primary management module in slot A and a secondary management module in slot B, and you remove the primary management module from slot A, the secondary, or backup, management module in slot B becomes the primary.

Features of the Management Module

Figure 3 shows the front panel of the BlackDiamond management module.

Figure 3: BlackDiamond 20808 Management Module



Management modules have the following features on the front panel:

- Console port—The DB-9 serial console port is used to connect a terminal, allowing you to perform local management.
- Management port—The 10/100 Mbps Ethernet management port allows you to connect an Ethernet cable directly from your laptop to the management port to view and locally manage the switch configurations. This port can also be used to connect the system to a parallel management network for administration.
- Reset button—Use the Reset button to reset the management module without removing the module from the chassis.

Management Module LEDs

LEDs on the management module (see Table 4) provide status information about the switch operation and major chassis components.

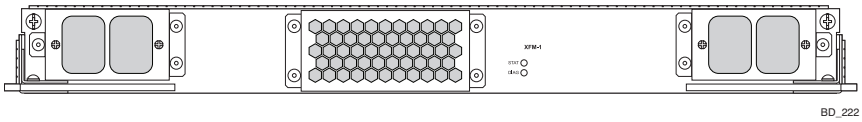
Table 4: LEDs on the Management Module

Label/Function	Color/State	Meaning
SYS System status	Green/blinking Off	System has booted and is operating normally. System is booting or is powered off.
MSTR Master/backup status of module	Green/steady Off	This management module is the master in the system. This management module is not the master in the system.
ENV Environmental status	Green/steady Amber/steady Off	The system is operating within the defined operational limits. The system is operating outside the defined operational limits. Environmental conditions for the system are unknown or the management module is not the master.
ERR Error	Green Amber Off	No critical errors are present. One or more critical errors are present. This management module is the backup module.
FAN1:Loser (front) fan tray FAN2:Upper (back) fan tray NOTE: FAN3 and FAN4 are not used.	Green/steady Amber/steady Off	The indicated fan tray is installed and operating within specification. The indicated fan tray has an error condition. See the system log for details The indicated fan tray is not installed
PSU Power supplies	Green/steady Amber/steady Off	The power supplies are operating normally. One or more power supplies have an error condition. See the system log for details. This management module is not receiving power.
PWR State of the power/fan controller on this module.	Green/blinking Amber/steady Amber/blinking	The power/fan controller is operating normally. The module is booting but is not yet operational. The power/fan controller has an error condition. See the system log for details.

Switch Fabric Module

The XFM-1 switch fabric modules (Figure 4) provide the active switching fabric for the switch. Each XFM-1 module provides 384 Gbps total switching capacity. Up to five XFM-1 modules can be installed in dedicated slots at the rear of the BlackDiamond 20808 chassis, providing a total switch fabric capacity of 2 Tbps.

Figure 4: XFM-1 Module



Switch fabric modules have internal fans that provide module cooling independent of the chassis ventilation system. The module air intake grills have filters.

LEDs on the module front panel (Table 5) indicate basic operating conditions for the module.

Table 5: LEDs on the XFM Switch Fabric Module

Label/Function	Color/State	Meaning
STAT	Green/blinking	Normal operation
Module status	Amber/blinking	Configuration error, code version error, diagnostic failure, or other severe module error
	Off	The module is not receiving power.
DIAG	Amber/blinking	Diagnostic tests are in progress.
Module diagnostics	Amber/steady	A diagnostic failure has occurred.
	Off	Normal operation

I/O Modules

The following I/O modules are available for the BlackDiamond 20808 switch:

- GM-40XA and GM-40XB modules
- XM-8XB module

No configuration information is stored on the I/O modules; all configuration information is stored on the management modules.

When a BlackDiamond 20808 switch is powered on, the software generates a default configuration for any slots that contain I/O modules. The default configuration allows the I/O module ports to participate in the VLAN named *default*. The default configuration for the I/O module is not preserved unless you explicitly save the configuration to NVRAM.

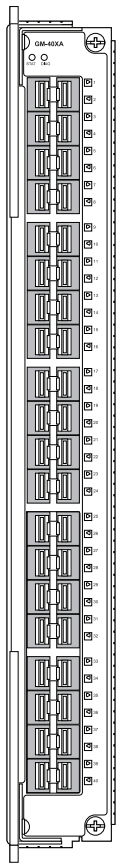
You can configure parameters of an I/O module after it is installed, or preconfigure a slot for a certain type of module and configuration. The preconfigured information is applied to the module after it is inserted. If you preconfigure a slot for a specific module type and then insert a different type of module, the inserted module reverts to its default configuration.

See the ExtremeXOS 12.2 Concepts Guide and the ExtremeXOS 12.2 Command Reference Guide for feature-specific information related to BlackDiamond 20808 series modules.

BlackDiamond GM-40XA and GM-40XB I/O Modules

The GM-40XA and GM-40XB modules (Figure 5) have forty unpopulated SFP-based Gigabit Ethernet ports. The GM-40XA (advanced) module supports up to 1 million MAC addresses and IP routes. The GM-40XB (basic) module supports up to 512K MAC addresses and IP routes. Both modules have the same physical features.

Figure 5: GM-40XA/GM-40XB Module



In the default configuration for the GM-40XA/GM-40XB modules, all ports:

- Are added to the default VLAN as untagged.
- Inherit the properties of the default VLAN (for example, protocol type and VLAN ID).

The GM-40XA/GM-40XB modules have the following LEDs:

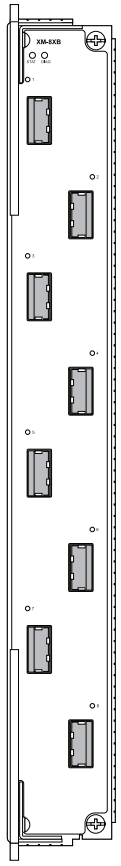
- Module status (STAT)
- Module diagnostics (DIAG)
- Port status

For information about the LEDs and their activity on the GM-40XA/GM-40XB modules, see "I/O Module LEDs" on page 24. For information about the SFP modules, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

BlackDiamond XM-8XB Module

The XM-8XB module (Figure 6) has eight unpopulated XFP-based 10-Gigabit Ethernet ports.

Figure 6: XM-8XB Module



In the default configuration for the XM-8XB module, all ports:

- Are added to the default VLAN as untagged.
- Inherit the properties of the default VLAN (for example, protocol type and VLANid).

The XM-8XB module have the following LEDs:

- Module status (STAT)
- Module diagnostics (DIAG)
- Port status

For information about the LEDs and their activity on the XM-8XB module, see "I/O Module LEDs" on page 24. For information about the SFP modules, see the *Extreme Networks Pluggable Interface Modules Installation Guide*.

I/O Module LEDs

Table 6 describes the LEDs on the BlackDiamond 20808 I/O modules.

Table 6: LEDs on the BlackDiamond I/O Modules

Type	Label/Function	Color/State	Meaning
Module	STAT Module status	Green/blinking	Normal operation.
		Amber/blinking	Configuration error, code version error, diagnostic failure, or other severe module error.
		Off	The module is not receiving power.
	DIAG Module diagnostics	Amber/blinking	Diagnostic tests are in progress.
		Amber/steady	A diagnostic failure has occurred.
		Off	Normal operation.
Port	Port status	Green/steady	Link is up.
		Green/blinking	Port is disabled.
		Amber blinking	Packet activity on port.
		Off	Link is down.

3 BlackDiamond 20808 Power Supplies

This chapter includes the following sections:

NOTE

For central DC power connections, the 1900 W DC PSU is intended to be installed only in restricted access locations (for example, a dedicated equipment room, equipment closet, or central office) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA-70. All wiring methods involving the DC input cable assembly must be performed according to the relevant articles of the National Electrical Code.

WARNING!

Field operators must not attempt to open the PSU enclosure for any reason; the PSU does not contain user-serviceable parts. In the event of failure, return the defective PSU to Extreme Networks for repair or replacement.

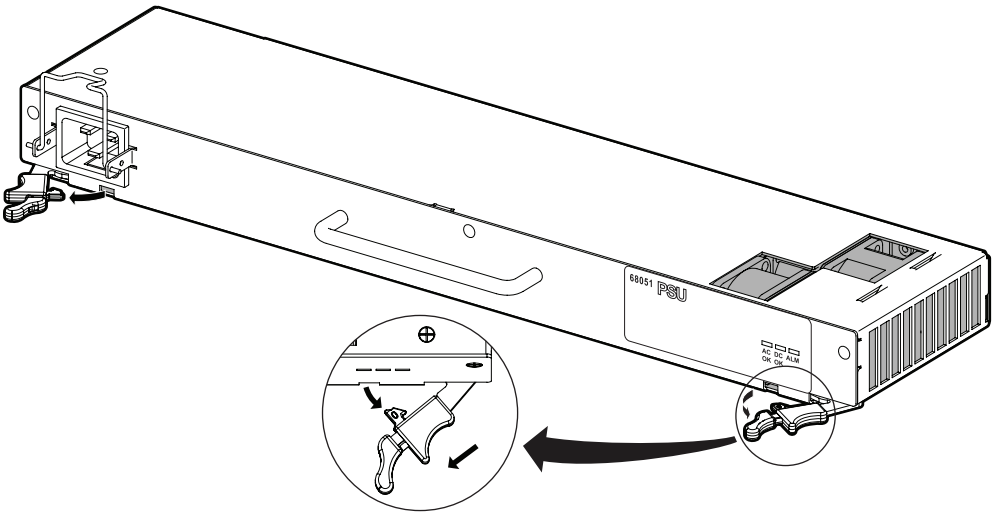
Overview of the BlackDiamond 20808 Power Supplies

The BlackDiamond 20808 switch can be powered by either AC or DC power supplies (PSUs). Power supplies in the BlackDiamond 20808 switch are fully fault tolerant and load-sharing in an N+1 configuration. After the system is properly configured, if one PSU fails, the others provide sufficient power to operate a fully loaded switch.

AC Power Supply

Figure 7 shows the 2400 W AC power supply unit. This power supply can run from 180 to 264 V AC and delivers 2400 W of power. The power supply bay in the BlackDiamond 20808 switch can accommodate up to five 2400 W AC PSUs.

Figure 7: 2500 W AC PSU



BD_173

Each 2400 W AC PSU contains two cooling fans at the right of the unit. Airflow enters from the right side vents on the PSU and exits out the left side vents of the switch. Airflow through the PSU is independent from the airflow through the rest of the switch.

For information about installing the 2300 W AC PSU, see Chapter 4.

LEDs

The Extreme Networks 2400 W AC PSU has status LEDs on the front panel. Table 7 describes the meanings of the LEDs.

Table 7: LEDs on the 2400 W AC PSU

PSU Condition	LED Type and Color		
	AC OK Green	DC OK Green	Alarm Red
Power supply outputs working normally	On	On	Off
AC input power present	On	Off	Off
No input power to this PSU only (receiving standby power from the chassis)	Off	Off	On
No input power to any PSU	Off	Off	Off
Power supply failure	On	Off	On

Fuse

The Extreme Networks 2400 W AC PSU line and neutral legs are both fused. Power to the switch may still be live if the neutral fuse is open. This is not a field operator replaceable fuse.

WARNING!

Field operators must not attempt to configure or replace fuses in Extreme Networks 2400 W AC PSUs! In the event of failure, immediately return the defective Extreme Networks 2400 W AC PSU for a complete replacement.

Power Supply Cords

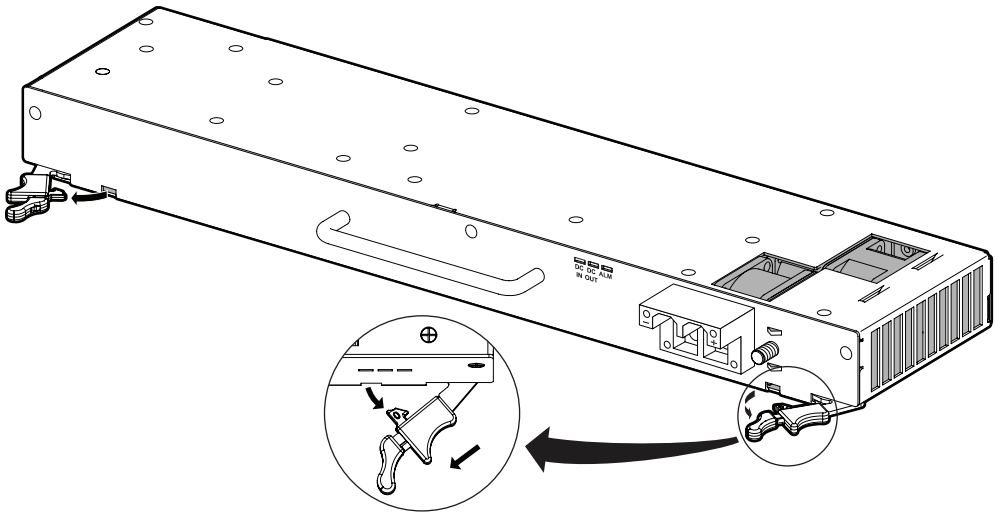
An AC power cord for use with the 2400 W AC PSU must meet the following requirements:

- The power cord must be agency-certified for the country of use and rated for 200-240 V AC.
- The power cord must have an IEC 320 C19 connector for connection to the PSU.
- The power cord must have an appropriately rated and approved wall plug applicable to the country of installation.
- The power cord must be less than 3 meters (10 feet) long.
- The wire size must be a minimum of 14 AWG (2.06 mm^2) copper-stranded.

DC Power Supply

Figure 8 shows the Extreme Networks 1900 W DC power supply unit. This power supply can run from 40 to 72 V DC and deliver 1900 W of power. The power supply bay in the BlackDiamond 20808 switch can accommodate up to five 1900 W DC PSUs.

Figure 8: 1900 W DC PSU



BD_180

Each 1900 W DC PSU contains two cooling fans at the right of the unit. Airflow enters from the right side vents on the PSU and exits out the left side vents of the switch. Airflow through the PSU is independent from the airflow through the rest of the switch.

To use the 1900 W DC PSU, you need a -48 V DC power source capable of providing 60 A dedicated power to each 1900 W DC PSU installed in the switch.

For information about installing the 1900 W DC PSU, see Chapter 4.

NOTE

Extreme Networks does not recommended using the 1900 W DC PSU in combination with an Extreme Networks 2400 W AC PSU in the same BlackDiamond 20808 system.

For central DC power connections, the 1900 W DC PSU is intended to be installed only in restricted access locations (such as a dedicated equipment room, equipment closet, or central office) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA-70.

LEDs

The Extreme Networks 1900 W DC PSU has status LEDs on the front panel. Table 8 describes the meanings of the LEDs.

Table 8: LEDs on the 1900 W DC PSU

PSU Condition	LED Type and Color		
	DC IN Green	DC OUT Green	ALM Red
Power supply outputs working normally	On	On	Off
DC input power present	On	Off	Off
No input power to this PSU only (receiving standby power from the chassis)	Off	Off	On
No input power to any PSU	Off	Off	Off
Power supply failure	On	Off	On

Fuse

The Extreme Networks 1900 W DC PSU -48 V and -48 V RTN legs are both fused. Power to the switch may still be live if the -48 V RTN fuse is open. This is not a field operator-replaceable fuse. In the event of failure, immediately return the 1900 W DC PSU to Extreme Networks for a complete replacement.

WARNING!

Field operators must not attempt to open the 1900 W DC PSU enclosure for any reason; the PSU does not contain user-serviceable parts. In the event of failure, return the defective 1900 W DC PSU to Extreme Networks for repair or replacement.

2 Installing the BlackDiamond 20808 Switch

4 Site Preparation

This chapter includes the following sections:

By carefully planning your site, you can maximize the performance of your existing network and ensure that it is ready to migrate to future networking technologies.

The information in this chapter is intended for the system administrator, network equipment technician, network manager, or facilities manager responsible for installing and managing the network hardware. The chapter assumes a working knowledge of local area network (LAN) operations and a familiarity with communications protocols that are used on interconnected LANs.

Installation, maintenance, and removal of a switch, chassis, or system components must be done by qualified service personnel only. Qualified service personnel have had appropriate technical training and experience that is necessary to be aware of the hazards to which they are exposed when performing a task and of measures to minimize the danger to themselves or other people.

To learn more about safety issues and to ensure safety compliance, see Appendix A.

NOTE

Before installing or removing any components of the system, or before carrying out any maintenance procedures, you must read the safety information provided in Appendix A of this guide.

Planning Your Site

To install your equipment successfully, you should plan your site carefully. The site planning process has three major parts:

- Meeting site requirements

  The physical installation site must meet the following requirements for a safe and successful installation:

  - Building and electrical code requirements
  - Environmental, safety, and thermal requirements for the equipment you plan to install
  - Equipment rack requirements
- Evaluating and meeting cable requirements

  After examining your physical site and ensuring all environment requirements are met, evaluate and compare your existing cable plant with the requirements of the Extreme Networks equipment to determine if you need to install new cables (or cabling).

- Meeting power requirements

  To run your equipment safely, you must meet the specific power requirements for each power supply unit installed in the system. For power supply specifications, see Appendix B.

Meeting Site Requirements

This section describes requirements to consider when preparing your installation site, including:

- Operating Environment Requirements
- Rack Specifications and Recommendations

Operating Environment Requirements

Verify that your site meets all environmental and safety requirements.

Virtually all areas of the United States are regulated by building codes and standards. During the early planning stages of installing or modifying your LAN, it is important that you develop a thorough understanding of the regulations that pertain to your location and industry.

Building and Electrical Codes

Building and electrical codes vary depending on your location. Comply with all code specifications when planning your site and installing cable. The following sections are provided as a resource to obtain additional information.

Information about major building codes is located at the following websites:

- International Code Council (ICC); 5203 Leesburg Pike; Falls Church, Virginia 22041 USA.

  http://www.iccsafe.org

  http://www.sbcci.org

Five authorities on electrical codes are:

- National Electrical Code (NEC) Classification (USA only)—a recognized authority on safe electrical wiring. Federal, state, and local governments use NEC standards to establish their own laws, ordinances, and codes on wiring specifications. The NEC classification is published by the National Fire Protection Association (NFPA). The address is NFPA; 1 Batterymarch Park; Quincy, Massachusetts 02169 USA. http://www.nfpa.org
- Underwriters' Laboratory (UL) (USA only)—an independent research and testing laboratory. UL evaluates the performance and capability of electrical wiring and equipment to determine whether they meet certain safety standards when properly used. Acceptance is usually indicated by the words "UL Approved" or "UL Listed." The address is UL; 333 Pfingsten Road; Northbrook, Illinois 60062-2096 USA. http://www.ul.com
- National Electrical Manufacturing Association (NEMA) (USA only)—an organization of electrical product manufacturers. Members develop consensus standards for cables, wiring, and electrical components. The address is NEMA; 1300 N. 17th Street; Rosslyn, Virginia 22209. http://www.nema.org
- Electronics Industries Alliance (EIA)—a trade association that develops technical standards, disseminates marketing data, and maintains contact with government agencies in matters relating to the electronics industry. The address is EIA; 2500 Wilson Boulevard; Arlington, Virginia 22201 USA. http://www.eia.org

- Federal Communications Commission (FCC)—a commission that regulates all interstate and foreign electrical communication systems that originate in the United States according to the Communications Act of 1934. The FCC regulates all U.S. telephone and cable systems. The address is FCC; 445 12th Street S.W.; Washington, D.C. 20554 USA. http://www.fcc.gov

Wiring Closet Considerations

Be aware of the following recommendations for your wiring closet:

- Be sure that your system is easily accessible for installation and service. See "Rack Specifications and Recommendations" on page 36 for information.
- Use appropriate AC or DC power, power distribution, and grounding for your specific installation.
- Use a vinyl floor covering in your wiring closet. (Concrete floors accumulate dust, and carpets can cause static electricity.)
- Prevent unauthorized access to wiring closets by providing door locks. Install the equipment in a secured, enclosed, and restricted access location, ensuring that only qualified service personnel have access to the equipment.
- Provide adequate overhead lighting for easy maintenance.
- Be sure that each wiring closet has a suitable ground. All equipment racks and equipment installed in the closet should be grounded.
- Be sure that all system environmental requirements are met, such as ambient temperature and humidity.

NOTE

Extreme Networks recommends that you consult an electrical contractor for commercial building and wiring specifications.

Electrostatic Discharge

Your system must be protected from static electricity or electrostatic discharge (ESD). Take the following measures to ensure optimum system performance:

- Remove materials that can cause electrostatic generation (such as synthetic resins) from the wiring closet. Check the appropriateness of floor mats and flooring.
- Connect metal chassis, conduit, and other metals to ground using dedicated grounding lines.
- Use electrostatically safe equipment and the ESD-preventive wrist strap that is provided with your equipment. All BlackDiamond switches have ESD-preventive wrist strap connectors and are shipped with an ESD-preventive wrist strap.

Humidity

To maximize equipment life, keep operating humidity between 50% and 70% relative humidity (non-condensing) during typical operation. The equipment can operate between 10% and 95% relative humidity (non-condensing) for short intervals.

Temperature

Extreme Networks equipment generates a significant amount of heat. It is essential that you provide a temperature-controlled environment for both performance and safety.

Install the equipment only in a temperature- and humidity-controlled indoor area that is free of airborne materials that can conduct electricity. Too much humidity can cause a fire. Too little humidity can produce electrical shock and fire.

Follow these general thermal recommendations for your wiring closet:

- Be sure that the ventilation in the wiring closet is adequate to maintain a temperature below 104° F (40° C).
- Install a reliable air conditioning and ventilation system.
- Keep the ventilation in the wiring closet running during non-business hours; otherwise, the equipment can overheat.
- Maintain an ambient operating temperature of 32° to 104° F (0° to 40° C).

NOTE

Short-term operation is permitted at –5°C to 0°C and 40°C to 55°C, for no more than 96 consecutive hours and a total of not more than 15 days in 1 year.

- Maintain a storage temperature of -40° to 158° F (-40° to 70° C).

NOTE

As with all electrical equipment, Extreme Networks product lifetimes degrade with increased temperature. If possible, temperatures should be kept at approximately 78° F (25° C) or lower.

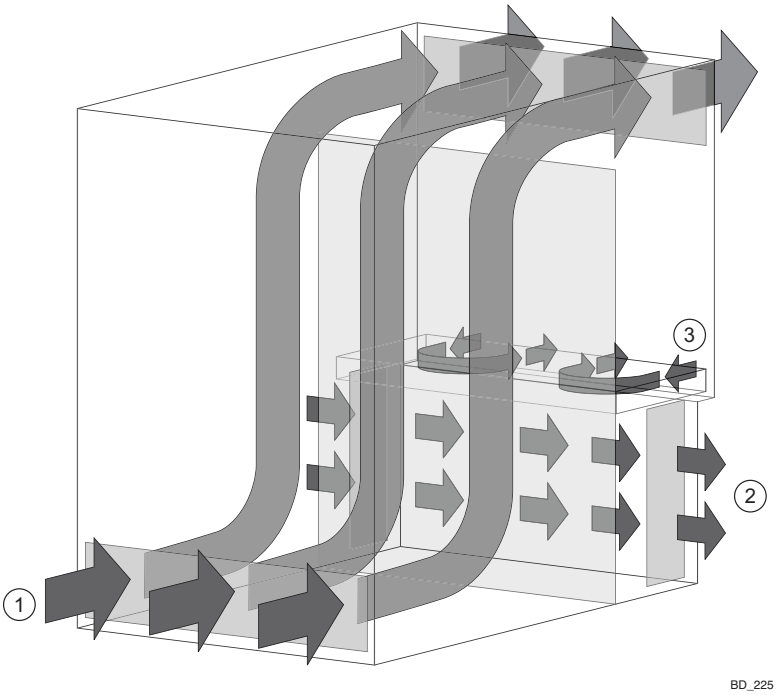
Chassis Airflow Requirements

To ensure proper airflow through a BlackDiamond switch, follow these recommendations:

- BlackDiamond 20808 switches require a minimum of 15 inches (38 cm) at the rear of the chassis from any cabinet wall or other obstruction for proper airflow to the switch fabric modules. If you install the BlackDiamond 20808 switch in a cabinet, do not use the rear cabinet door unless there is at least 12 inches (30.5 cm) of unobstructed space behind the switch.
- Install the PSU air baffles on the chassis to direct airflow from the PSU fans away from adjacent equipment.
- If you install the BlackDiamond 20808 switch in a 4-post equipment rack, make sure that the rear rack posts do not obstruct airflow to the power supplies. The distance from the front of the chassis to the PSU vents is 22 inches (56 cm). Allow a minimum of 5 inches (12.7 cm) of clear space in front of a front-opening PSU air baffle.
- Air temperature measured approximately 1 inch (2.5 cm) from the fan inlet should be less than 104 °F (40 °C).

In the BlackDiamond 20808 switch, air moves through the power supplies independently of the airflow through the front-installed modules and the XFM-1 modules in the back (see Figure 9). In addition, the XFM-1 modules have internal fans that cool these modules independently of the rest of the switch.

Figure 9: Air Flow Through the BlackDiamond 20808 Switch



1 = Air flow through the front-installed modules
2 = Air flow through the PSUs
3 = Air flow through the switch fabric modules

NOTE

When the air baffles are attached to the PSU air vents on the chassis, they modify the air intake and outflow through the PSU bays so that air is pulled from the direction of the chassis front and blown out toward the rear of the chassis.

Space Requirements for the Switch

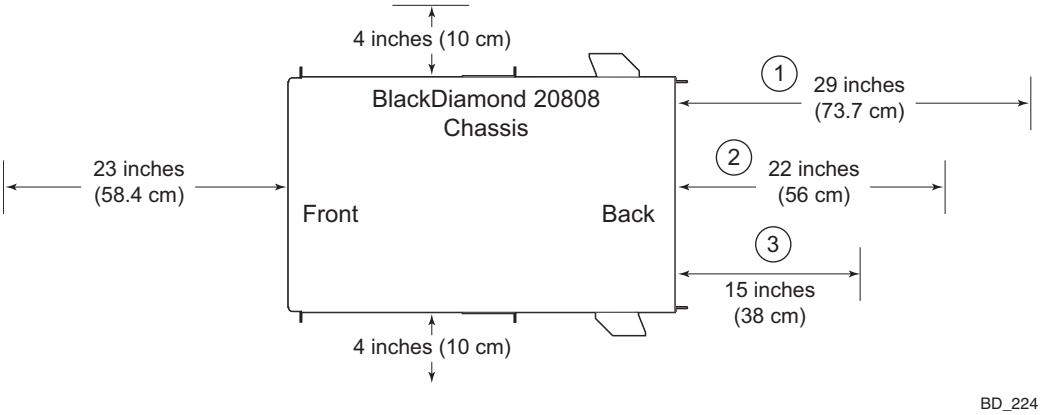
Provide enough space in front of and behind the switch so that you can service it easily (see Figure 10). Minimum distances required for servicing and ventilation are as follows:

- At the back of the chassis:
  - Minimum of 29 inches (73.7 cm) for replacing the rear fan tray without adjusting the fan rails (dimension A in Figure 10)
  - Minimum of 22 inches (56 cm) for replacing the rear fan tray if you collapse the fan rails (dimension B in Figure 10)
  - Minimum of 15 inches (38 cm) at all times for proper ventilation and cooling of the XFM1 switch fabric modules (dimension C in Figure 10)
- At the front of the chassis:

  Minimum of 22 inches for replacing front-installed modules or the front fan tray
- At each side of the chassis:

  Minimum of 4 inches at the rear side to allow ventilation of the PSUs

Figure 10: Space Requirements Around the BlackDiamond 20808 Switch



Rack Specifications and Recommendations

Racks should conform to conventional standards. In the United States, use EIA Standard RS-310C: Racks, Panels, and Associated Equipment. In countries other than the United States, use IEC Standard 297. In addition, verify that your rack meets the basic mechanical, space, and earthquake requirements that are described in this section.

Mechanical Recommendations for the Rack

Use equipment racks that meet the following mechanical recommendations:

- Use an open style, 19-inch rack to facilitate easy maintenance and to provide proper ventilation.
- The minimum opening between the rack posts must be 17.75 inches (45.1 cm) from top to bottom; the rack posts must be plumb.
- Use a rack made of steel or aluminum.
- The rack should use the universal mounting rail hole pattern that is identified in IEC Standard 297.
- The rack should have designated earth grounding connections (typically on the base).
- The rack must meet earthquake safety requirements equal to that of the installed chassis.
- The mounting holes should be flush with the rails to accommodate the chassis.
- The rack should support approximately 925 pounds (420 kilograms).
- If you install the BlackDiamond 20808 switch in a cabinet, do not use the rear cabinet door unless at least 12 inches (30.5 cm) of unobstructed space is available behind the switch.

Protective Grounding for the Rack

Use a rack grounding kit and a ground conductor that is carried back to earth or to another suitable building ground.

All Extreme Networks switches are designed with mounting brackets that provide solid metal-to-metal connection to the rack. If you do not use equipment racks, you can attach wiring terminals directly to the mounting brackets for appropriate grounding. Extreme Networks switches have grounding terminals on the back of the chassis.

At a minimum, follow these guidelines to ground equipment racks to the earth ground:

- CAD weld appropriate wire terminals to building I-beams or earth ground rods.
- Use the appropriate chassis grounding wire for your system. The appropriate wire selection depends on the available input current to the power supply.
  - For AC systems using a 20A breaker per PSU, the minimum size for the chassis ground is 14 AWG. The power cable ground should be the same size as the primary.
  - For DC systems using a 55A breaker per PSU, the minimum size of the chassis ground is 4 AWG. The power cable ground should be the same size as the primary.

NOTE

For complete details about power supplies and power supply cords, refer to Chapter 3, "BlackDiamond 20808 Power Supplies,"and "Selecting Power Supply Cords" on page 116 in Appendix A. Drill and tap wire terminals to equipment racks.

- Position the earth ground as close to the equipment rack as possible to maintain the shortest possible wiring distance.
- Use a ground impedance tester or micro-ohm meter to test the quality of earth ground connection at the chassis. This will ensure good grounding between the chassis, rack, and earth ground.

NOTE

Because building codes vary worldwide, Extreme Networks strongly recommends that you consult an electrical contractor to ensure proper equipment grounding for your specific rack.

The rack should be attached to the wiring closet floor with 3/8-inch (9.5 mm) lag screws or equivalent hardware. The floor under the rack should be level within 3/16-inch (5 mm). Use a floor-levelling cement compound if necessary or bolt the racks to the floor.

Brace open equipment racks if the channel thickness is less than 1/4 inch (6.4 mm).

Meeting Power Requirements

This section describes power requirements, including:

- Power Supply Requirements
- AC Power Cord Requirements
- Uninterruptible Power Supply Requirements

Power Supply Requirements

Adhere to the following requirements to operate your Extreme Networks equipment safely:

- Be sure that your equipment is placed in an area that accommodates the power consumption and component heat dissipation specifications.
- Be sure that your power source meets the site power or AC power requirements of the network equipment.

- When connecting power to installed equipment, avoid connecting through an extension cord or power strip.
- If your switch includes more than one power supply, connect each power supply to different, independent power sources.

  If a power source fails, it will affect only the power supply to which it is connected. If all switch power supplies are connected to a single power source, the entire switch is vulnerable to a power source failure.

For power specifications of the BlackDiamond 20808 switch, see Appendix B, "Technical Specifications."

WARNING!

The chassis does not have a switch for turning power to the unit on and off. For systems using AC power supplies, power to the chassis is disconnected by removing the wall plug from the electrical outlet. For systems using DC power supplies, power to the chassis is turned off by de-energizing the circuit that feeds the power supply, which is usually accomplished by turning off a circuit breaker.

AC Power Cord Requirements

Use an AC power cord appropriate for your country. Check your local electrical codes and regulatory agencies for power cord requirements. The countries listed in Table 9 have additional requirements as listed in the table.

NOTE

Make sure that each installed AC power supply attaches to an independent power source.

Table 9: AC Power Cable Requirements

Country	Requirements
USA and Canada	• The cable set must be UL-approved and CSA-certified. • The minimum specification for the flexible cable is No. 14 AWG (1.5 mm^2), Type SVT or SJT, 3-conductor. • The cable set must have a rated current capacity of at least the amount rated for each specific product. • The attachment plug must be either an Earth-grounding type with a NEMA 6-20P (20 A, 220 V) configuration or a NEMA L6-20P (20 A, 208/240 V)
Denmark	The supply plug must comply with section 107-2-D1, standard DK2-1a or DK2-5a.
Switzerland	The supply plug must comply with SEV/ASE 1011.
Argentina	The supply plug must comply with Argentinian standards.

Replacing the Power Cord

If the AC power cord plug is unsuitable and must be replaced, connect the power supply wires for the switch according to the following scheme:

- Brown wire to the Live (Line) plug terminal, which may be marked with the letter "L" or colored red.
- Blue wire to the Neutral plug terminal, which may be marked with the letter "N" or colored black.
- Yellow/Green wire to the Ground plug terminal, which may be marked with the letter "E" (the Earth symbol) or colored yellow/green.

Uninterruptible Power Supply Requirements

An uninterruptible power supply (UPS) is a device that sits between a power source (such as an AC wall outlet) and a device (such as a power supply in a switch) to prevent outages, sags, surges, and bad harmonics from adversely affecting the performance of the device.

A UPS traditionally can perform the following functions:

- Absorb relatively small power surges.
- Smooth out noisy power sources.
- Continue to provide power to equipment during line sags.
- Provide power for some time after a blackout has occurred.

In addition, some UPS or UPS plus software combinations provide the following functions:

- Automatically shut down equipment during long power outages.
- Monitor and log power supply status.
- Display the voltage (current draw) of the equipment.
- Restart equipment after a long power outage.
- Display the voltage currently on the line.
- Provide alarms on certain error conditions.
- Provide short circuit protection.

Selecting a UPS

To determine UPS requirements for your switch, answer these questions:

- What are the amperage requirements?
- What is the longest potential time period that the UPS would be required to supply backup power?
- Where will the UPS be installed?
- What is the maximum transition time that your installation will allow?

NOTE

Extreme Networks recommends that you use a UPS that provides online protection.

Calculating Volt-Amperage Requirements

To determine the minimum volt-amperage requirements for your UPS:

1. Locate the voltage and amperage requirements for each piece of equipment. These numbers are usually located on a sticker on the back or bottom of your equipment.
2. Multiply the numbers together to get Volt-Amps (VA):

   VA = Volts x Amperes
3. Add together the VA from all the pieces of equipment to find the total VA requirement.

   To determine the minimum volt-amperage requirements for your UPS, we recommend that you add 30% to the total.

UPS Transition Time

Transition time is the time that is necessary for the UPS to transfer from utility power to full-load battery power. For Extreme Networks products, a transition time of less than 20 milliseconds is required for optimum performance.

Evaluating and Meeting Cable Requirements

This section describes requirements for the cable you should use when installing your network equipment. It includes:

- Cabling Standards
- Cable Labeling and Record Keeping
- Installing Cable
- RJ-45 Connector Jackets
- Radio Frequency Interference

Cabling Standards

Extreme Networks recommends using the Building Industry Consulting Service International (BICSI) Registered Communications Distribution Designer (RCDD), which is globally recognized as a standard in site planning and cabling. For information, go to:

http://www.bicsi.org

Cable Labeling and Record Keeping

A reliable cable labeling system is essential when planning and installing a network. Maintaining accurate records helps you to:

- Relocate devices easily.
- Make changes quickly.
- Isolate faults in the distribution system.
- Locate the opposite end of any cable.
- Know the types of network devices that your cabling infrastructure can support.

Consider the following recommendations when setting up a cable labeling system suitable for your installation:

- Identify cables by securely attaching a label to all cable ends.
- Assign a unique block of sequential numbers to the group of cables that run between each pair of wiring closets.
- Assign a unique identification number to each equipment rack.
- Identify all wiring closets by labeling the front panel of your Extreme Networks equipment and other hardware.
- Keep accurate and current cable identification records.
- Post records near each equipment rack. Include the following cable drop information: the cable source, destination, and jumper location.

Installing Cable

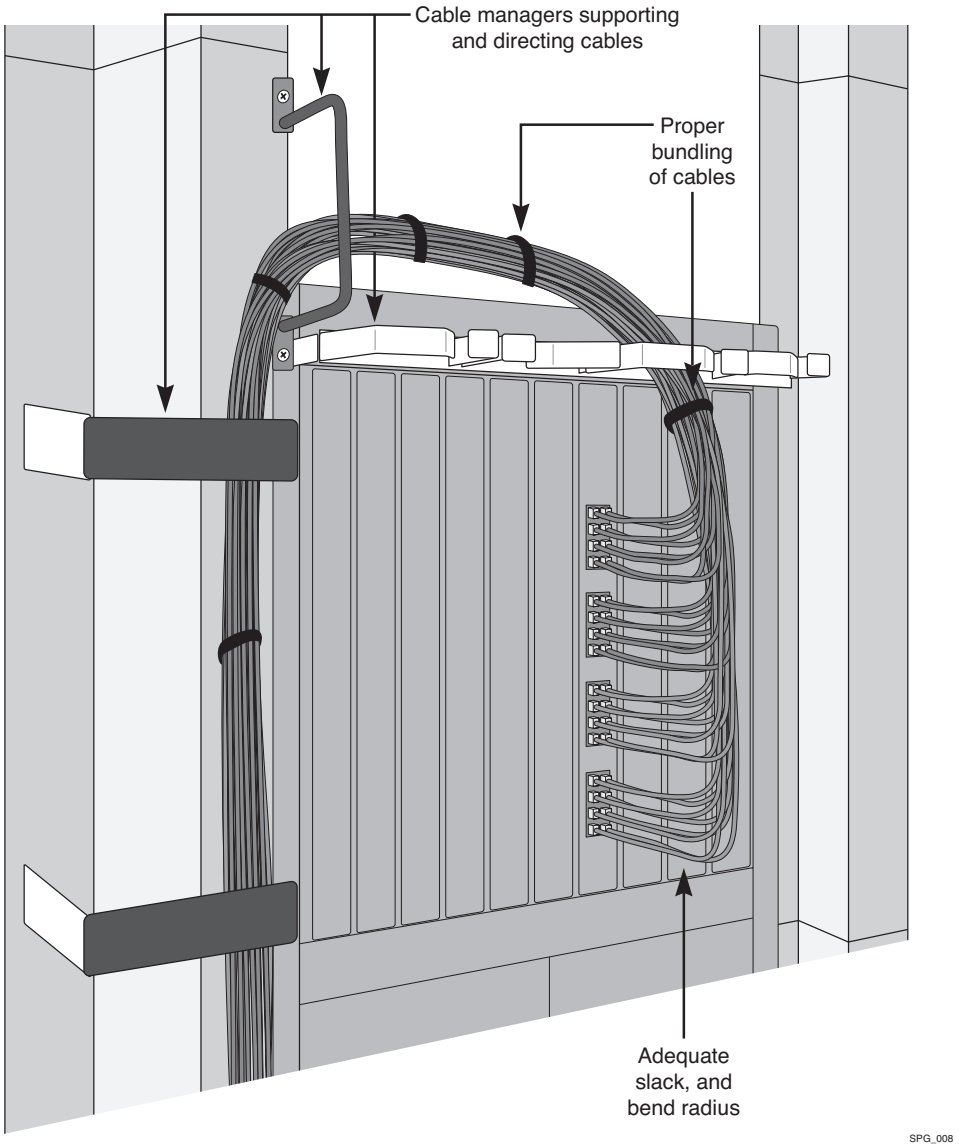
Consider the following recommendations when you connect cable to your network equipment:

- Examine cable for cuts, bends, and nicks.
- Support cable using a cable manager that is mounted above connectors to avoid unnecessary weight on the cable bundles. For information about the BlackDiamond cable management hardware, see Chapter 3.
- Use cable managers to route cable bundles to the left and right of the network equipment to maximize accessibility to the connectors.
- Install cables so that they do not block the chassis air intake or exhaust vents.
- Provide enough slack, approximately 2 to 3 inches (5.08 to 7.62 cm), to provide proper strain relief as shown in Figure 11.
- Bundle cable using velcro straps to avoid injuring cables.
- If you build your own cable, be sure that cable is properly crimped.
- When installing a patch panel using twisted pair wiring, untwist no more than 1 inch (2.54 cm) of the cable to avoid radio frequency (RF) interference.
- Discharge the RJ-45 Ethernet cable before plugging it into a port on the switch.
- Use plenum-rated cable when it is necessary for safety and fire rating requirements. Consult your local building codes to determine when it is appropriate to use plenum-rated cable, or refer to IEC standard 850.
- Keep all ports and connectors free of dust.

CAUTION

Unshielded twisted pair (UTP) cable can build up ESD charges when being pulled into a new installation. Before connecting any category 5 UTP cable to the switch, discharge ESD from the cable by plugging the RJ-45 connector into a LAN static discharge device or use an equivalent method.

Figure 11: Properly Installed and Bundled Cable



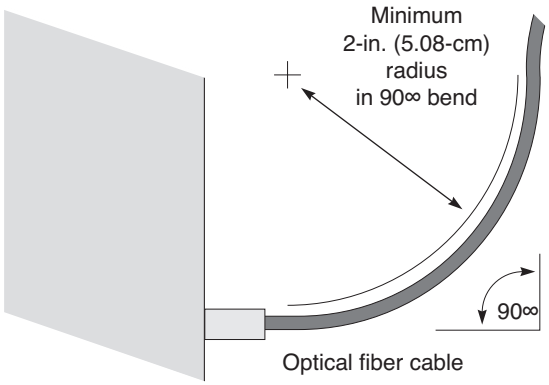
Fiber Optic Cable

Fiber optic cable must be handled carefully during installation. Every cable has a minimum bend radius, for example, and fibers will be damaged if the cables are bent too sharply. It is also important not to stretch the cable during installation. We recommend that the bend radius for fiber optic cable equal 2 inches (5.08 cm) minimum for each 90 degree turn as shown in Figure 12.

NOTE

Kinks and sharp bends can destroy or impair the cable's ability to convey light pulses accurately from one end of the cable to the other. Use care in dressing the optical fiber cables: provide satisfactory strain relief to support the cable and maintain an adequate bend radius at all cable turns, particularly where the cable connects to the I/O module.

Figure 12: Bend Radius for Fiber Optic Cable



Cable Distances

Table 10 shows cable media types and maximum distances that support reliable transmission in accordance with international standards, except where noted.

Table 10: Media Types and Maximum Distances

Standard	Media Type	Mhz•Km Rating	Maximum Distance (Meters)
1000BASE-SX (850 nm optical window)	50/125 µm multimode fiber	400	500
	50/125 µm multimode fiber	500	550
	62.5/125 µm multimode fiber	160	220
	62.5/125 µm multimode fiber	200	275
1000BASE-LX (1300 nm optical window)	50/125 µm multimode fiber	400	550
	50/125 µm multimode fiber	500	550
	62.5/125 µm multimode fiber	500	550
	10/125 µm single-mode fiber	–	5,000
	10/125 µm single-mode fiber*	–	10,000
1000BASE-LX70 (1550 nm optical window)	10/125 µm single-mode fiber	–	70,000
1000BASE-T	Category 5 and higher UTP cable	–	100
100BASE-TX	Category 5 and higher UTP cable	–	100
10BASE-T	Category 3 and higher UTP cable	–	100

* Proprietary to Extreme Networks. Connections between two Extreme Networks 1000BASE-LX interfaces that use 10/125 µm single-mode fiber can use a maximum distance of 10,000 meters.

RJ-45 Connector Jackets

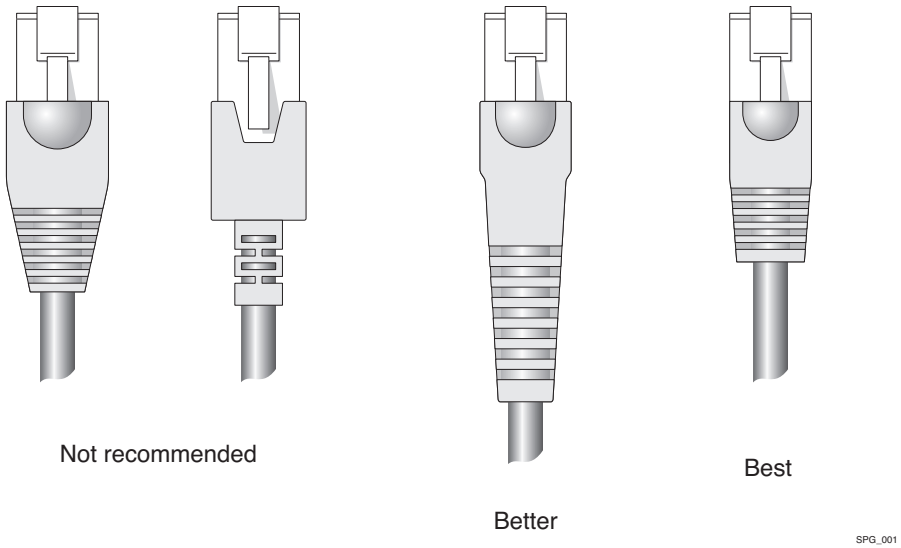
Use RJ-45 cable with connector jackets that are flush with the connector or that have connectors with a no-snag feature.

Using cable with jackets that are wider than the connectors can cause:

- Connectors that are not properly aligned with the port.
- Crowded cable installation, which can cause connectors to pop out of the port.

Figure 13 shows examples of connector jacket types that are not recommended, as well as those that are recommended.

Figure 13: RJ-45 Connector Jacket Types



Radio Frequency Interference

If you use UTP cabling in an installation, take precautions to avoid RF interference. RF interference can cause degradation of signal quality, and, in an Ethernet network environment, can cause excessive collisions, loss of link status, or other physical layer problems that can lead to poor performance or loss of communication.

To prevent RF interference, avoid the following situations:

- Attaching UTP cable to AC power cables
- Routing UTP cable near antennas, such as a ham radio antenna
- Routing UTP cable near equipment that could exhibit RF interference, such as ARC welding equipment
- Routing UTP cable near electrical motors that contain coils
- Routing UTP cable near air conditioner units
- Routing UTP cable near electrical transformers

In areas or applications where these situations cannot be avoided, use fiber optic cabling or shielded twisted pair (STP) cabling.

Applicable Industry Standards

For more information, see the following ANSI/TIA/EIA standards:

- ANSI/TIA/EIA-568-A—discusses the six subsystems of a structured cabling system.
- ANSI/TIA/EIA-569-A—discusses design considerations.
- ANSI/TIA/EIA-606—discusses cabling system administration.
- ANSI/TIA/EIA-607—discusses commercial building grounding and bonding requirements.

You can access these standards at:

http://www.ansi.org

or

http://www.tiaonline.org

5 Installing the BlackDiamond 20808 Chassis

This chapter provides instructions for installing the BlackDiamond 20808 chassis in an equipment rack. The BlackDiamond 20808 chassis is designed to fit into a standard 19-inch equipment rack. Optional mid-mount brackets allow you to install the chassis in a mid-mount position.

This chapter includes the following sections:

Unpacking

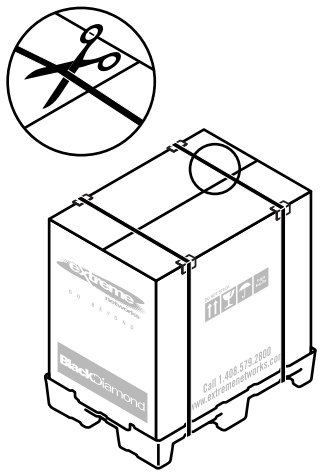
CAUTION

An unpopulated BlackDiamond 20808 chassis weighs approximately 165 pounds as shipped. Lifting the BlackDiamond 20808 chassis safely requires a minimum of two people or appropriate lifting equipment.

Refer to the illustrations printed on the BlackDiamond 20808 shipping container and unpack the chassis and accessories as follows:

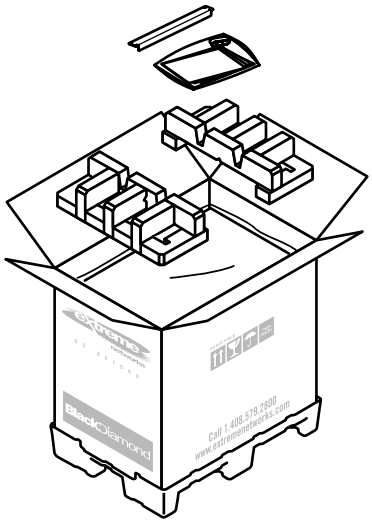
1 Cut the straps around the box (Figure 14).

Figure 14: Opening the Box



2 Open the top flaps of the box and remove the support brackets, boxed accessories, and customer materials package (Figure 15). Lay these items aside until they are needed.

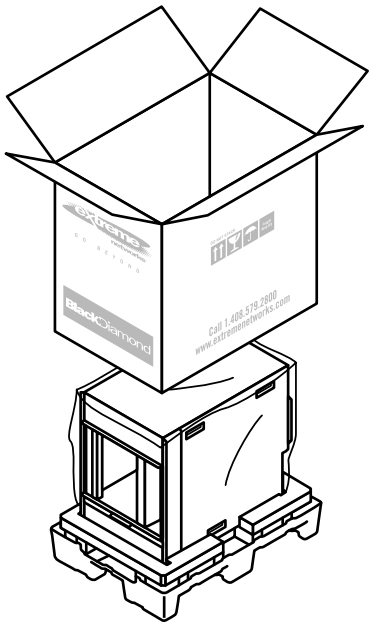
Figure 15: Removing the Accessories



3 Remove the top packing foam pieces.

4 Lift the box off the shipping pallet with the chassis.

Figure 16: Removing the Top Packing Foam



5 Open the top of the chassis packing bag and slide the bag down around the base of the chassis.

At this point the chassis is ready to be lifted out of the lower packing foam and installed in an equipment rack.

Pre-Installation Requirements

For detailed information about rack specifications and space requirements, see Chapter 2.

CAUTION

An unpopulated BlackDiamond 20808 chassis weighs approximately 165 pounds. as shipped. Extreme Networks recommends that you remove all installed blanks and the front fan tray before you install the chassis in the rack. Removing these items will reduce the chassis weight by approximately 44 pounds.

Lifting the chassis safely requires a minimum of two people, or appropriate lifting equipment. When you install the chassis in a rack, it is advisable to have a third person to help guide the chassis into position in the rack.

To install the BlackDiamond 20808 chassis in an equipment rack, you need the following tools:

- ESD-preventive wrist strap (provided)
- 19-inch support bracket (two provided)
- Rack-mount screws appropriate for your organization's rack system, as follows:
  - 4 screws to attach each support bracket
  - 12 screws to secure the chassis in the rack

  The screw size will vary based on your organization's rack system; screws are not provided.
- Screwdriver appropriate for the selected rack mounting screws
- # 2 Phillips screwdriver (only for mid-mount installation)

  Use a Phillips screwdriver to attach the mid-mount brackets to the middle of the chassis sides.
- Chassis grounding materials as listed on page 55.

NOTE

Read the information in this chapter thoroughly before you attempt to install the BlackDiamond 20808 chassis.

The chassis sides have hand-grip recesses to help you lift and maneuver the chassis.

Front-Mounting a BlackDiamond 20808 Chassis

CAUTION

If you front-mount a BlackDiamond 20808 chassis in a 4-post rack, make sure that the rear posts do not obstruct airflow to the PSUs at the back. The distance from the front of the chassis to the PSU vents is 22 inches (56 cm). Allow a minimum of 5 inches (12.7 cm) of clear space in front of a front-opening PSU air baffle.

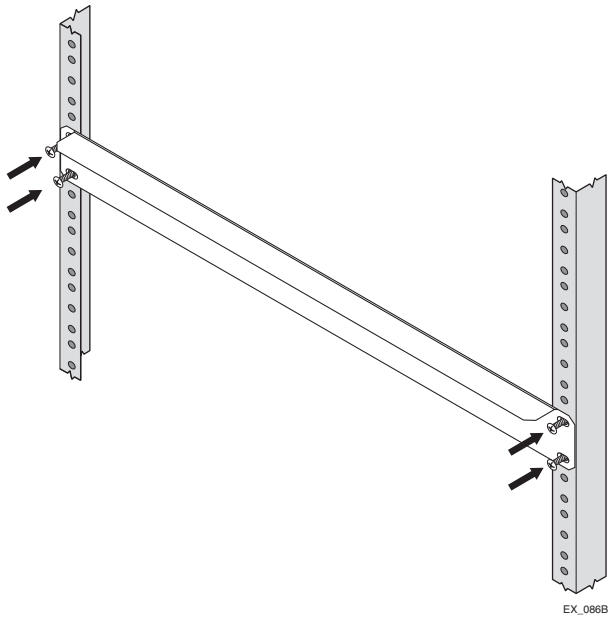
If you install the BlackDiamond 20808 switch in a cabinet, do not use the rear cabinet door unless at least 12 inches (30.5 cm) of unobstructed space is available behind the switch.

To front-mount a BlackDiamond 20808 chassis:

1. Identify the rack location where the chassis will be installed.
2. Using four rack mounting screws, attach a support bracket to the equipment rack immediately below the chassis location (Figure 17). (Screws are not provided.)

For an installation in a 4-post rack, you can install the second support bracket across the rear rack posts.

Figure 17: Attaching the Support Bracket

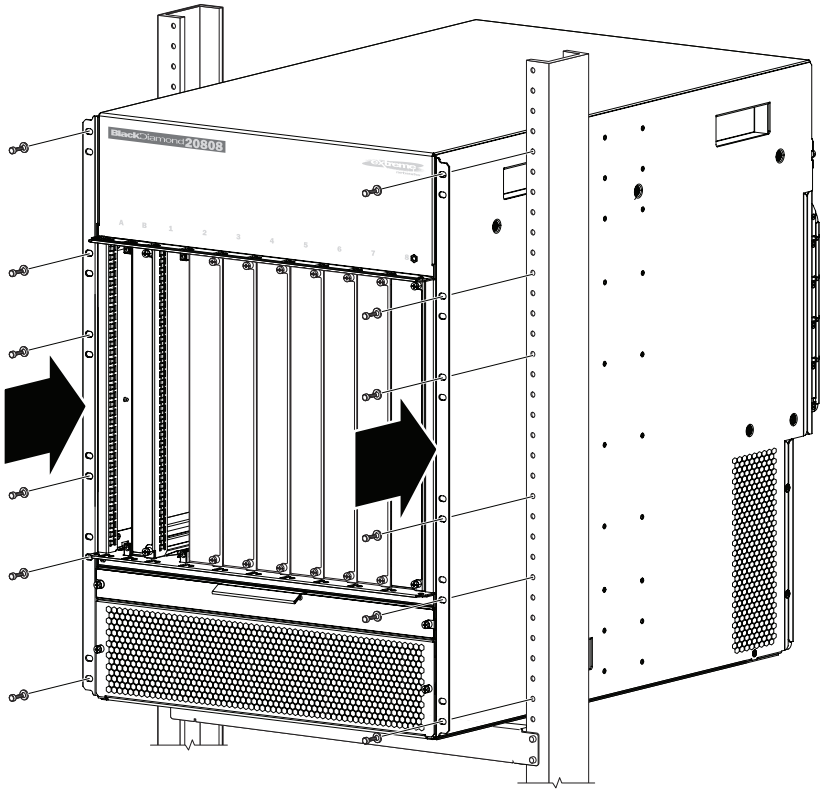


3 From the front of the rack, lift the back of the empty BlackDiamond 20808 chassis onto the support bracket.

4 Slowly guide the chassis into the equipment rack until the mounting brackets are flush against the rack uprights.

5 Secure the chassis to the equipment rack using 12 rack mounting screws. (Screws are not provided.) Be sure that the screws are secure. Refer to Figure 18 for the screw locations.

Figure 18: Securing the Chassis to the Rack



6 Attach the PSU air baffles to the sides of the chassis, following the instructions in "Attaching the PSU Air Baffles" on page 54.

CAUTION

Properly installed PSU air baffles prevent the hot PSU exhaust of one system from being drawn into the PSU air intake of an adjacent system, and therefore protect against premature thermal shutdown of the PSU or early power supply failure. For all installations where two or more BlackDiamond 20808 switches are installed next to each other, you must install the PSU air baffles.

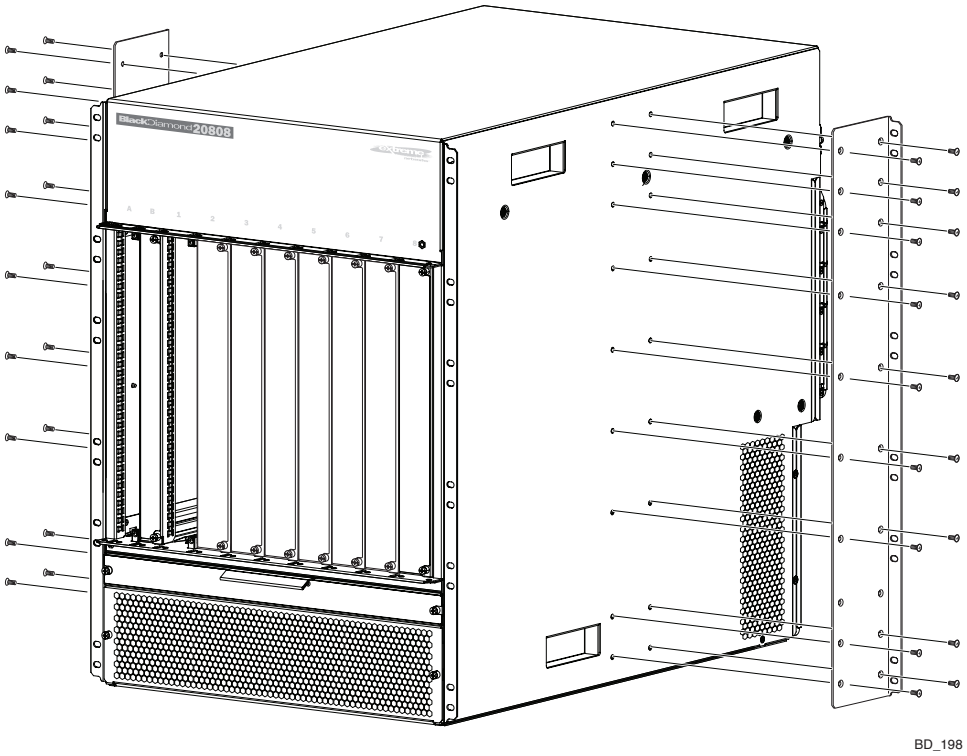
Mid-Mounting a BlackDiamond 20808 Chassis

To mid-mount a BlackDiamond 20808 chassis:

1 On each side of the chassis, align a mid-mount brackets with its mounting holes on the chassis sheet metal.

2 Using a #2 Phillips screwdriver, insert and tighten the mounting screws to secure the bracket to the chassis (Figure 19).

Figure 19: Attaching a Mid-mount Bracket

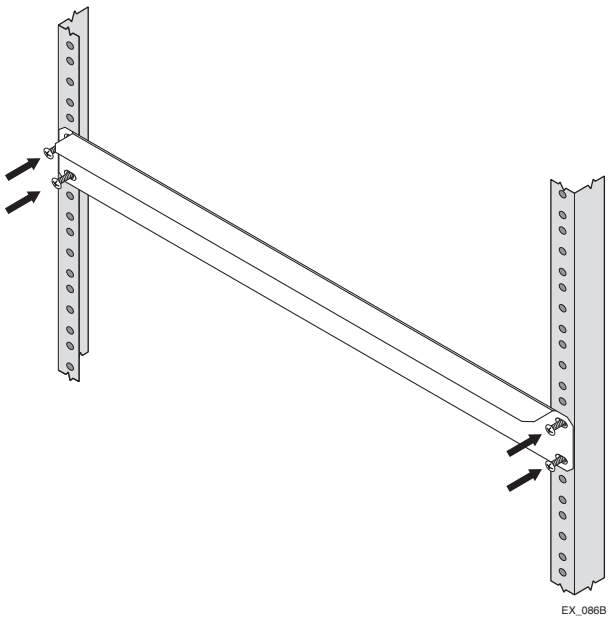


3 Identify the rack location where the chassis will be installed.

4 Using four rack mounting screws, attach the support bracket to the equipment rack immediately below the chassis location (Figure 20). (Screws are not provided.)

To provide wider support for the chassis as you install it, you can attach the second support bracket on the other side of the rack post.

Figure 20: Attaching the Support Bracket

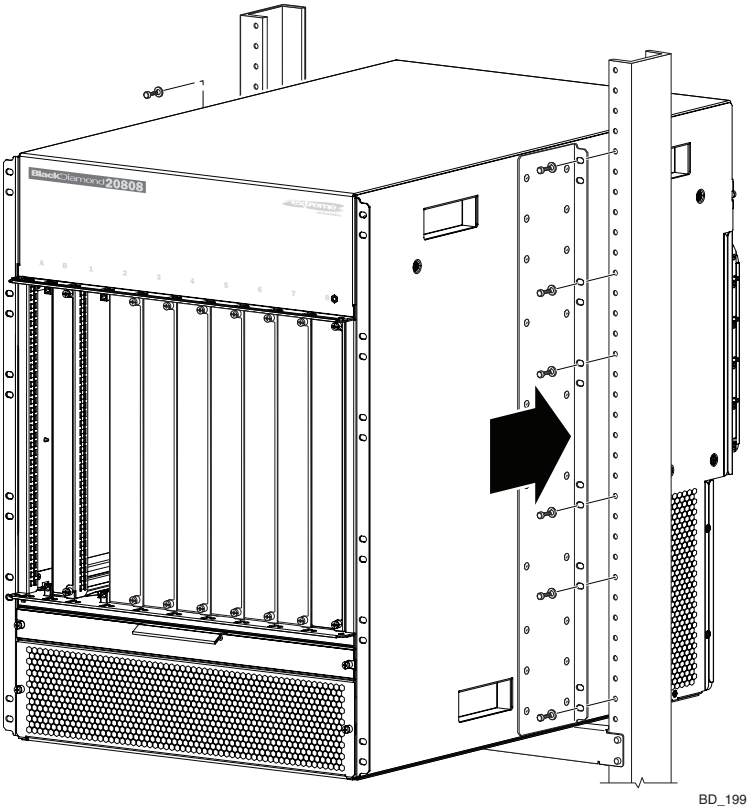


5 From the front of the rack, lift the back of the empty BlackDiamond 20808 chassis onto the support bracket.

6 Slowly guide the chassis into the equipment rack until the mounting brackets are flush against the rack uprights.

7 Secure the chassis to the equipment rack using 12 rack mounting screws. (Screws are not provided.) Be sure that the screws are secure. Refer to Figure 21 for the screw locations.

Figure 21: Securing the Chassis to the Rack (Mid-mount Installation)



8 Attach the PSU air baffles to the sides of the chassis, following the instructions in "Attaching the PSU Air Baffles."

CAUTION

Properly installed PSU air baffles prevent the hot exhaust of one system from being drawn into the air intake of an adjacent system, and therefore protect against premature failure of the PSU. For all installations where two or more BlackDiamond 20808 switches are installed next to each other, you must install the PSU air baffles.

Attaching the PSU Air Baffles

The air intake and exhaust vents for the BlackDiamond 20808 power supplies are on the sides of the chassis. Attach the provided air baffles to redirect airflow from the PSU fans away from adjacent equipment.

NOTE

Make sure that the open side of each baffle has adequate clearance to permit air intake and outflow. A minimum of 5 inches is recommended at each open side.

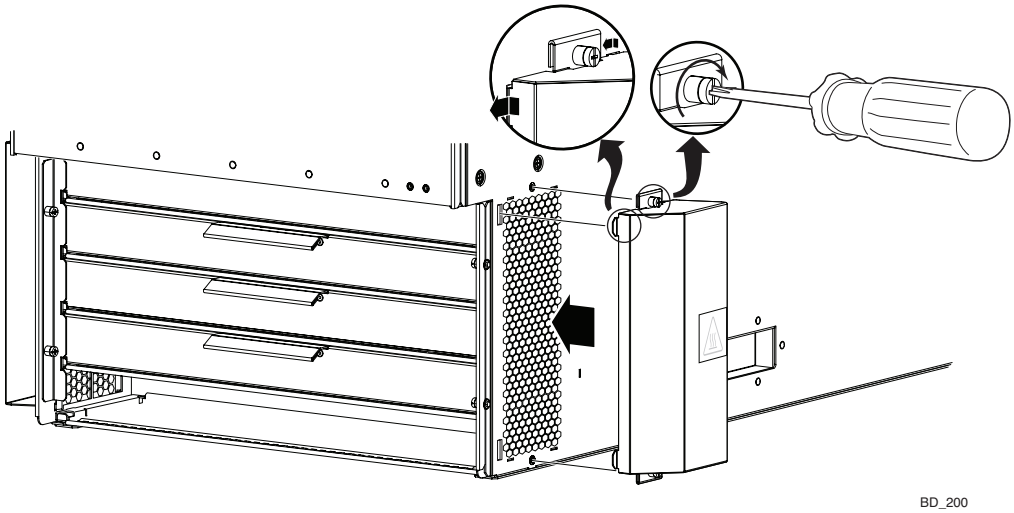
To attach the air baffles:

1 On the side of the chassis, locate the slots for the top and bottom locking tabs. Determine whether the open side of the baffle will face the front or back of the chassis.

   On the left side (as you face the rear of the chassis), the baffle must open toward the back of the chassis. On the right side, the baffle must open toward the front of the chassis.

2 Position the baffle over the air intake grill and insert the back edge tabs into the slots at the edge of the grill (Figure 22).

Figure 22: Installing an Air Baffle



3 Align the top and bottom locking tabs with the small slots above and below the air intake grill, and push the tabs into the slots.

4 With the baffle against the side of the chassis, slide it toward the back edge of the baffle to engage the locking tabs.

5 Secure the baffle to the chassis using the captive retaining screws.

6 Repeat steps 2 through 5 to attach the other baffle.

Grounding the BlackDiamond 20808 Chassis

Although grounding the BlackDiamond 20808 chassis is optional, it is recommended. The rear panel of the chassis provides a grounding point with threaded holes for attaching a ground cable.

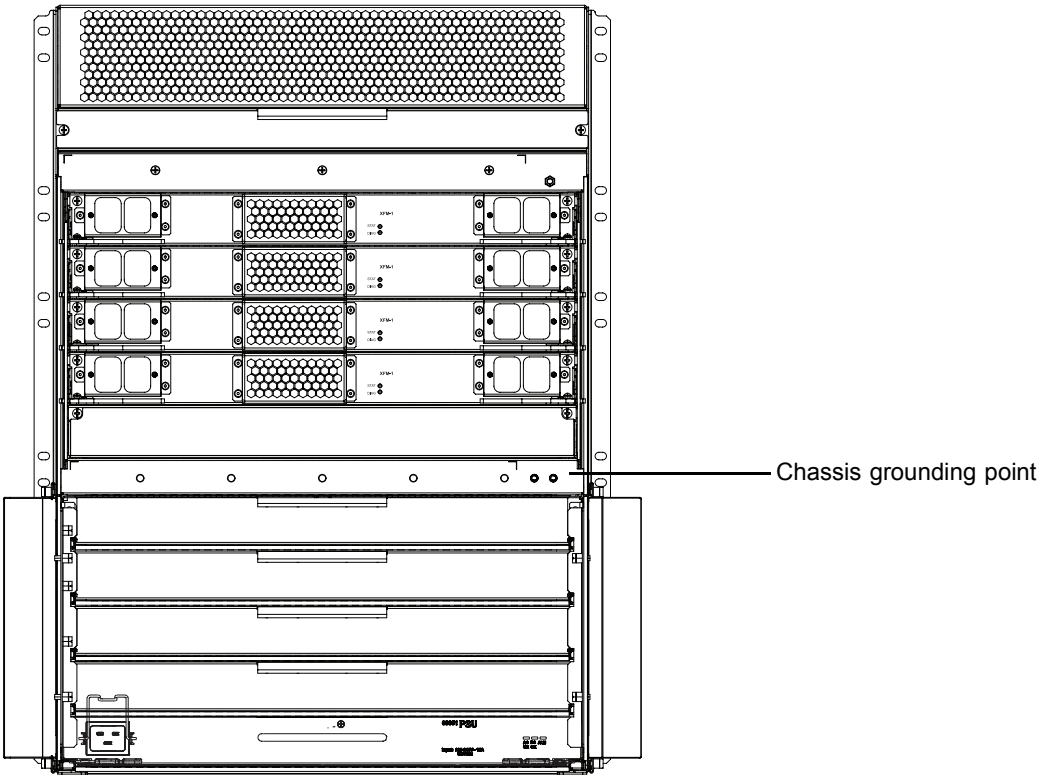
You need the following materials to ground the chassis:

- Two 10-24 screws
- One copper, standard barrel 2-hole compression grounding lug with 0.63-inch hole spacing, type LDC, equivalent to Panduit part number LCD4-14A-L or Thomas & Betts part number: LCN4-14
- Appropriate copper grounding wire for your system, based on the available input current for the power supply:
  - For AC systems using a 20A breaker per PSU, the chassis ground minimum size is 14 AWG.
  - For DC systems using a 60A breaker per PSU, the chassis ground minimum size is 4 AWG.

To ground the chassis:

1 Locate the grounding point on the back of the chassis (Figure 23).

Figure 23: Back of BlackDiamond 20808 Chassis



2 Strip 0.5 inch (1.2 cm) of insulation from the copper wire cable.

3 Insert the stripped wire into the cable lug.

4 Crimp the lug onto the cable according to the manufacturer's specifications.

5 Insert the screws through the lug and into the grounding point on the back of the chassis. Tighten the screws securely.

6 Connect the other end of the wire to a known reliable earth ground point at your site.

6 Installing Power Supplies in the BlackDiamond 20808 Switch

This chapter describes how to install and remove the power supplies in the BlackDiamond 20808 switch.

This chapter includes the following sections:

Installing a 2400 W AC Power Supply Unit (PSU)

NOTE

Extreme Networks does not recommended using the 2400 W AC PSU in combination with an Extreme Networks 1900 W DC PSU in the same BlackDiamond 20808 system.

Pre-Installation Requirements

You need the following tools and equipment to install or remove an Extreme Networks 2400 W AC PSU:

- ESD-preventive wrist strap
- AC power cord rated for 200–240 V AC

  An AC power cord is not included with the 2400 W AC PSU. You must obtain a power supply cord that meets the requirements listed under "Selecting Power Supply Cords" on page 116.
- Thermal protective gloves (required for removal)

CAUTION

Do not connect a power cord to a power supply that is not installed in a chassis.

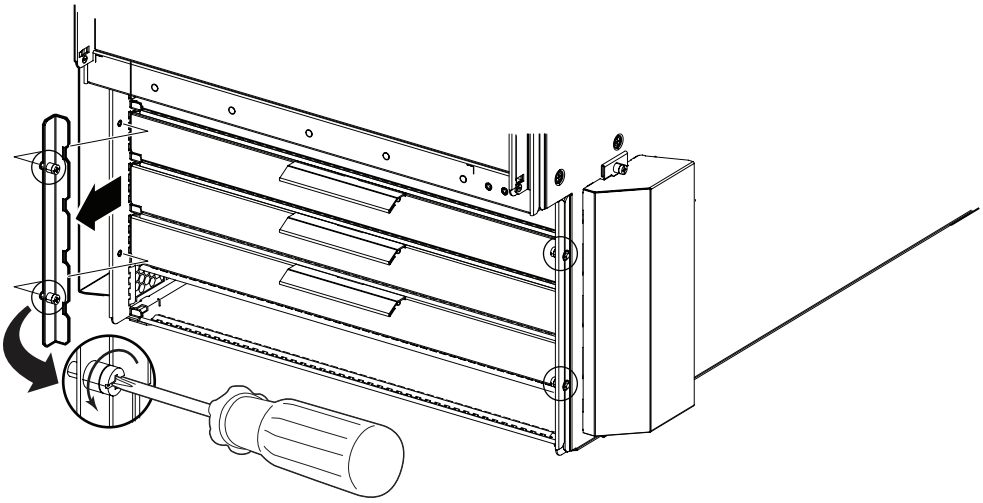
Installing an AC Power Supply

To install an Extreme Networks 2400 W AC PSU:

1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle on the top right corner of the switch front panel.

2 At each side, completely loosen the captive retaining screws and remove the power supply retainer from the chassis (see Figure 24).

Figure 24: Removing the Power Supply Retainers

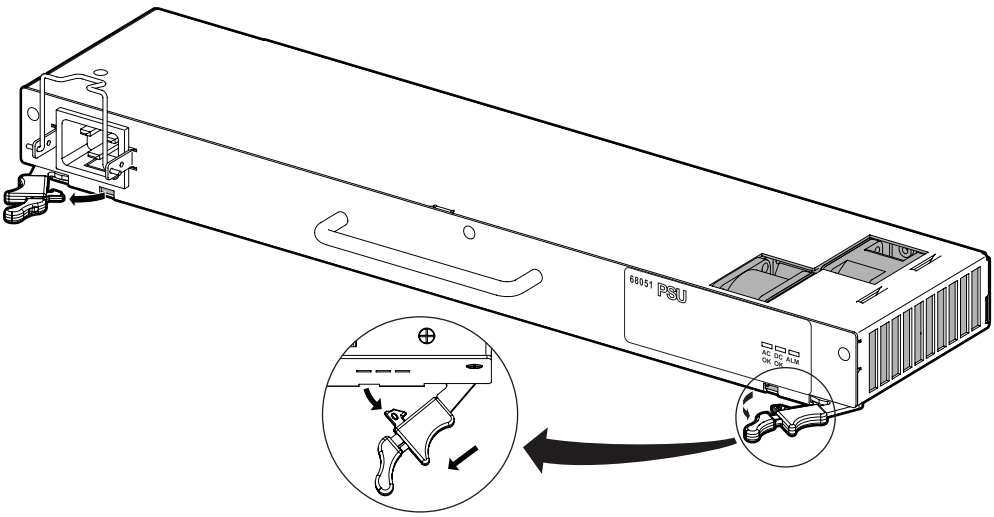


3 If necessary, remove a blank cover from the PSU slot.

4 Verify that the PSU is right side up and the latches are open (see Figure 25).

To open the latches, push the spring-loaded catch and rotate the latches away from the front of the PSU.

Figure 25: Latches on the Extreme Networks 2400 W AC PSU



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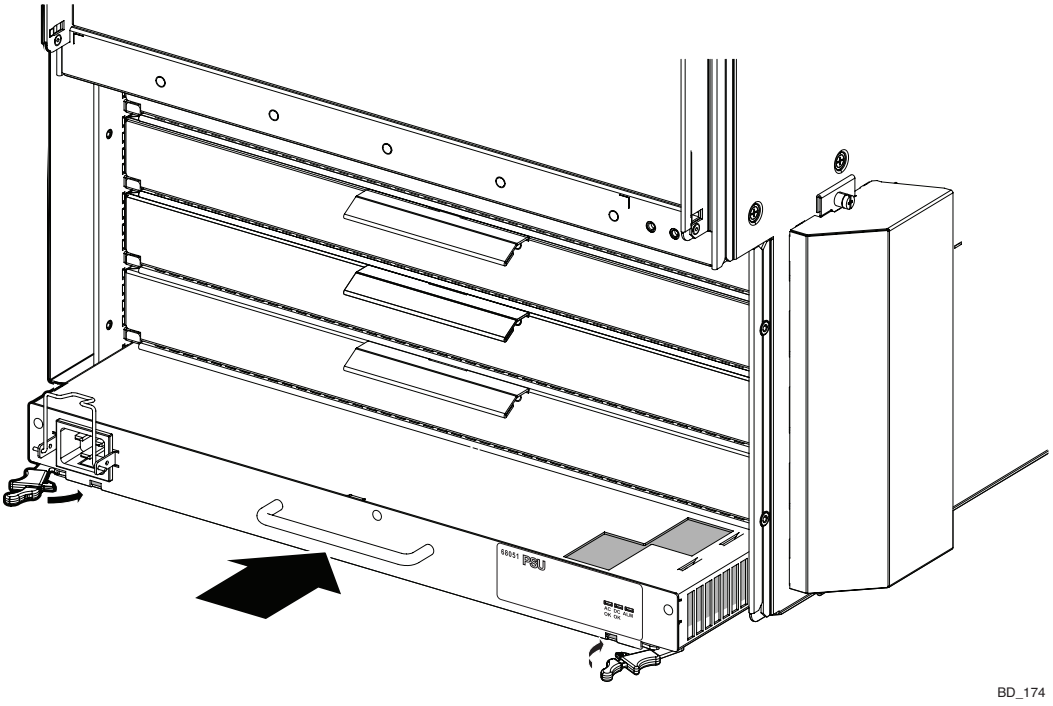
5 Support both sides of the PSU as you carefully slide the unit all the way into the power supply bay (Figure 26).

CAUTION

Do not slam the PSU into the system switch backplane. Use the latches to secure the PSU in the chassis.

Figure 26: Inserting the 2400 W AC PSU into the Power Supply Bay



6 Secure the 2400 W AC PSU in the power supply bay by rotating the latches toward each other until the unit clicks into place.

Make sure that **both** latches engage properly and that they **both** latch securely.

If either latch does not engage the side of the chassis, the PSU is not properly aligned and will not operate correctly. In this case, pull the unit out, open the latches, and re-insert the unit, making sure it is properly aligned as it goes into the bay.

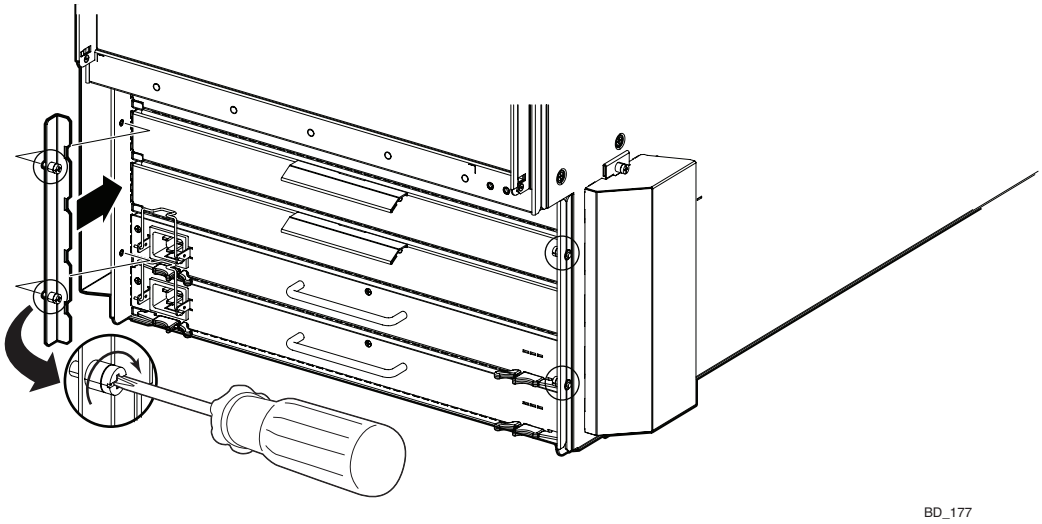
7 To install more PSUs, repeat steps 3 through 6.

8 After all the PSUs are installed, re-attach a power supply retainer on each side of the power supply bay as follows:

a Set the retainer against the power supply with the rubber cushion toward the power supply and the captive retaining screws aligned with the side of the BlackDiamond 20808 chassis (see Figure 27).

b Insert and fully tighten the captive retaining screws.

Figure 27: Attaching a Power Supply Retainer



Connecting Power

The BlackDiamond 2400 W AC PSU has a power cord retainer to reduce the chance of accidental disconnection of the cord from the PSU. The PSU has one of the following types of retainer:

- Wire retainer that rotates down over the connector and cord
- Metal clamp that attaches to the input connector on the PSU and clamps around the cord connector

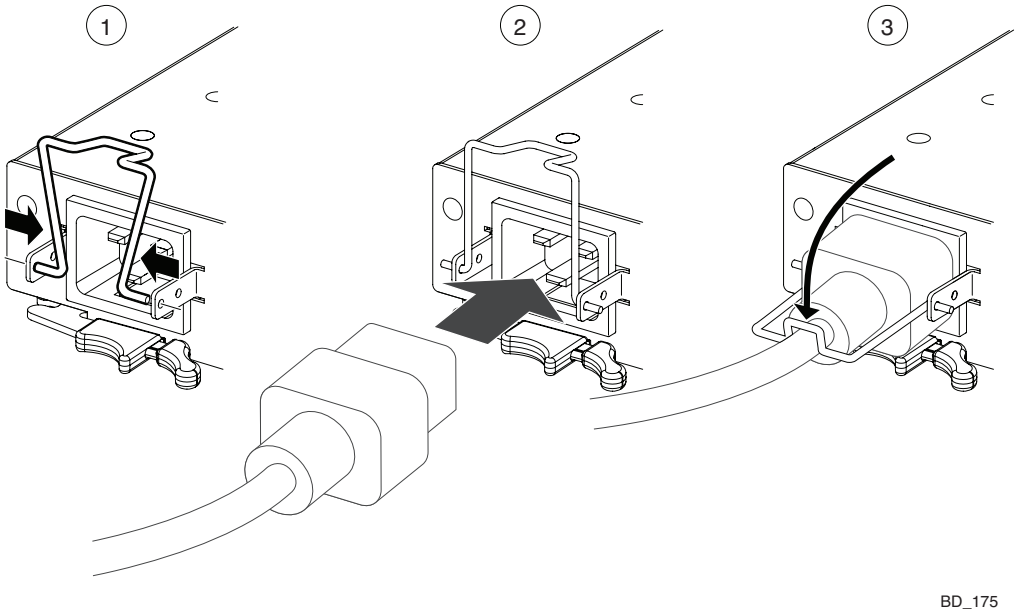
Using the Wire-Style Power Cord Retainer

1 As shown in Figure 28, squeeze the sides slightly and insert the ends of the wire into the attachment tab on each side of the power input connector.

2 Connect the AC power cord to the power input connector.

3 Rotate the retainer down over the power cord.

Figure 28: Connecting Power with a Wire-Style Power Cord Retainer



4 Connect the other end of the power cord to a grounded AC power outlet.

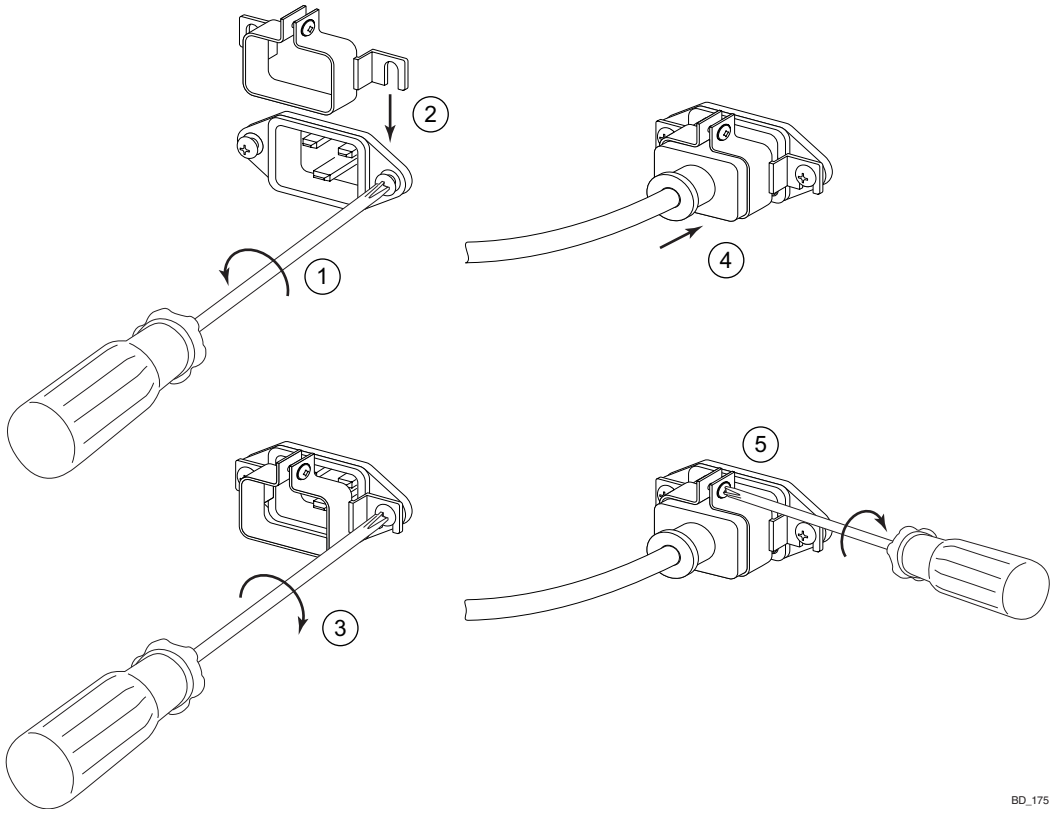
Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Using the Clamp-Style Power Cord Retainer

1 Attach the power cord retainer to each installed PSU as follows (see Figure 29):

- **a** Loosen the two screws on the AC input connector housing on the PSU.
- **b** Slide the power cord retainer down and between the loosened screw-heads and the AC input socket as shown in Figure 29.
- **c** Tighten the screws to secure the power cord retainer.

Figure 29: Connecting Power with the Clamp-Style Power Connector Retainer



2 Connect the AC power cord to the PSU as follows:

   a Loosen the middle screw of the power cord retainer to allow the power cord connector to slide through it.

   b Connect the power cord connector to the AC input on the front of the PSU (see Figure 294).

   c After the power cord is connected, tighten the middle screw of the power cord retainer to secure the power cord in place.

3 Connect the other end of the power cord to a grounded AC power outlet.

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Removing an Extreme Networks 2400 W AC PSU

CAUTION

The AC PSU may be hot to the touch; use thermal protective gloves when handling the PSU during removal.

To remove an Extreme Networks 2400 W AC PSU:

1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle on the top right corner of the switch front panel.

2 Disconnect the AC power cord from the wall outlet.

3 Disconnect the AC power cord from the AC input on the PSU in either of the following ways:

- Rotate the wire retainer up out of the way, and then disconnect the cord.
- Loosen the middle screw of the power cord bracket to allow removal of the power cord. Then disconnect the cord.

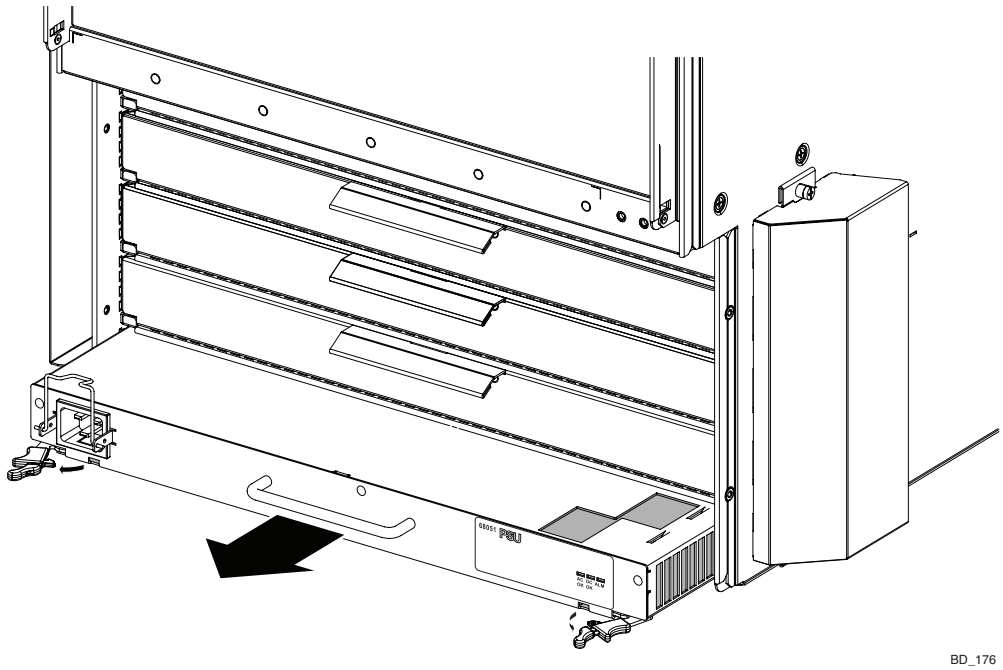
4 At each side, completely loosen the captive retaining screws and remove the power supply retainers from the chassis.

5 Push the spring-loaded catch on each latch, and rotate the latches away from the front of the PSU to disconnect the unit from the chassis.

6 Use the handle to slide the PSU out of the chassis (Figure 30).

Be sure to support both sides of the PSU as you remove it from the chassis.

Figure 30: Removing a 2400 W AC PSU



7 If you are not installing a replacement PSU, install a PSU blank cover over the unoccupied slot. (S "Installing a PSU Blank Slot Cover" on page 71) All unoccupied chassis slots must be covered at all times to maintain proper system ventilation and EMI levels.

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Installing a 1900 W DC Power Supply

NOTE

Extreme Networks does not recommended using the 1900 W DC PSU in combination with an Extreme Networks 2400 W AC PSU in the same BlackDiamond 20808 system.

Required Tools and Materials

You need the following tools and materials to install or remove an Extreme Networks 1900 W DC PSU:

- #6 AWG stranded copper cable for connecting the PSU to the DC power source.

  A DC power cord is not included with the 1900 W DC PSU. You must provide the #6 AWG stranded copper cable. Recommended insulation colors are:

  - Red for the –48V connection (–)
  - Black for the –48V RTN connection (+)
  - Green or green with yellow stripe for the ground connection
- Connection hardware appropriate to the installation site:
  - Hardware for connecting the power wires to the DC source
  - Hardware for connecting the ground wire to the site grounding point

  Lugs and other hardware for connecting the power and ground wires to the PSU are provided.
- Stripping tool
- Crimping tool for attaching the lugs to the power and ground cables
- Heat-shrink tubing and heat gun
- #1 Phillips screwdriver (for cover on terminal block)
- #2 Phillips screwdriver (for PSU retainers)
- Torque screwdriver and wrench or torque driver with attachments for tightening screws and nuts

  Use a 3/8-inch driver for the nut on the grounding wire attachment.
- ESD-preventive wrist strap
- Thermal protective gloves (required for removal of a PSU)

Installation Summary

To install the 1900 W DC PSU, perform the following tasks in the order listed:

1. Prepare the power cables and ground cable by attaching the provided connection lugs to the cables (see next section).
2. Insert the PSU into the BlackDiamond 20808 chassis.
3. Connect the ground.
4. Have a qualified licensed electrician connect the PSU to the DC source voltage.
5. Energize the DC circuit.

CAUTION

Make sure that the Extreme Networks 1900 W DC PSU circuit is not overloaded. Use proper over-current protection, such as a circuit-breaker, to prevent over-current conditions.

Preparing the Cables

Three right-angle lugs (Burndy part number YA6CL1-90, #6 AWG wire lug) are provided with the PSU. You need a crimping tool to attach the lugs to the power and ground cables.

To prepare the cables:

1 On each wire, strip 0.5 inch of insulation from one end.

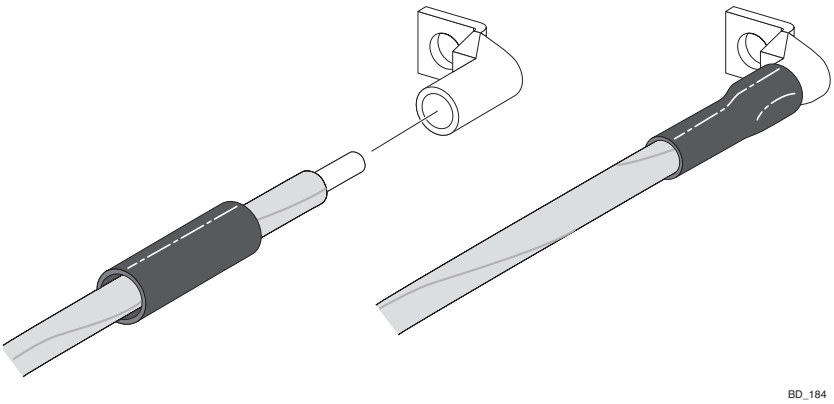
2 Slide a 1-inch piece of heat-shrink tubing over the end of the wire.

3 Insert a stripped wire end all the way into the barrel of a lug (Figure 31) and crimp the lug securely to the wire.

NOTE

Make sure that no copper is visible between the lug and the cable insulation.

Figure 31: Attaching the Lug to the Cable



4 Slide the heat-shrink tubing over the crimped barrel of the lug and use a heat gun to shrink the tubing around the lug and wire.

5 Repeat steps 2 through 4 for the other two lengths of wire.

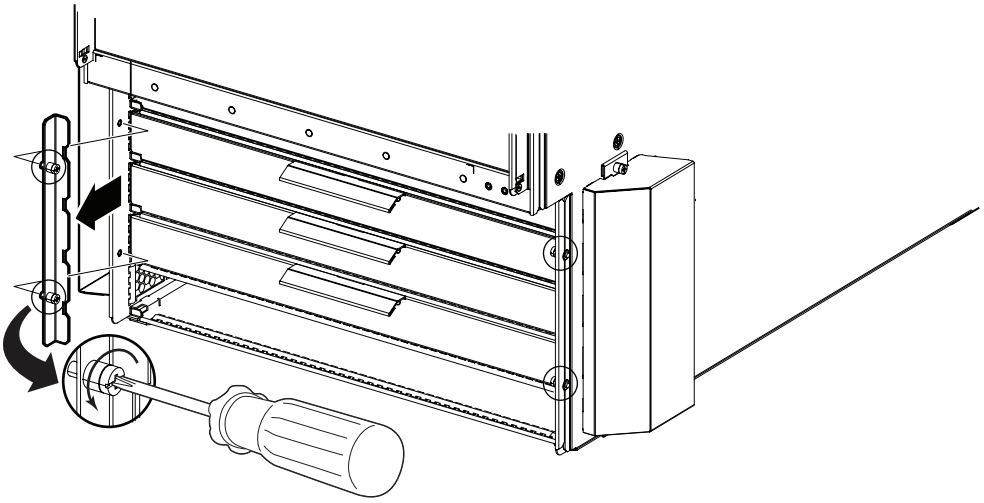
Installing the Power Supply

To install an Extreme Networks 1900 W DC PSU:

1 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle above the switch fabric modules.

2 At each side, completely loosen the captive retaining screws and remove the power supply retainer from the chassis (see Figure 32).

Figure 32: Removing the Power Supply Retainers

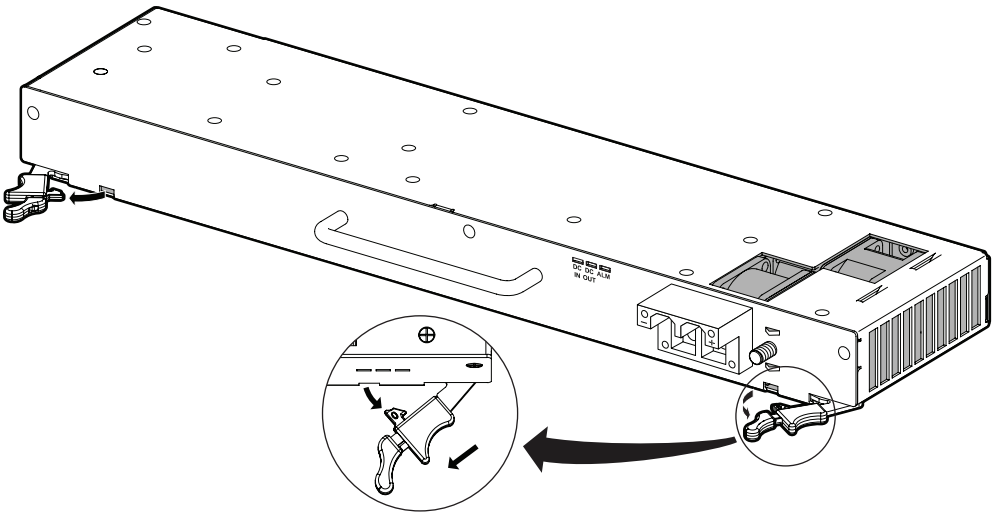


3 If necessary, remove a blank cover from the PSU slot.

4 Verify that the PSU is right side up and the latches are open (see Figure 33).

To open the latches, push the spring-loaded catch and rotate the latches away from the front of the PSU.

Figure 33: Latches on the Extreme Networks 1900 W DC PSU



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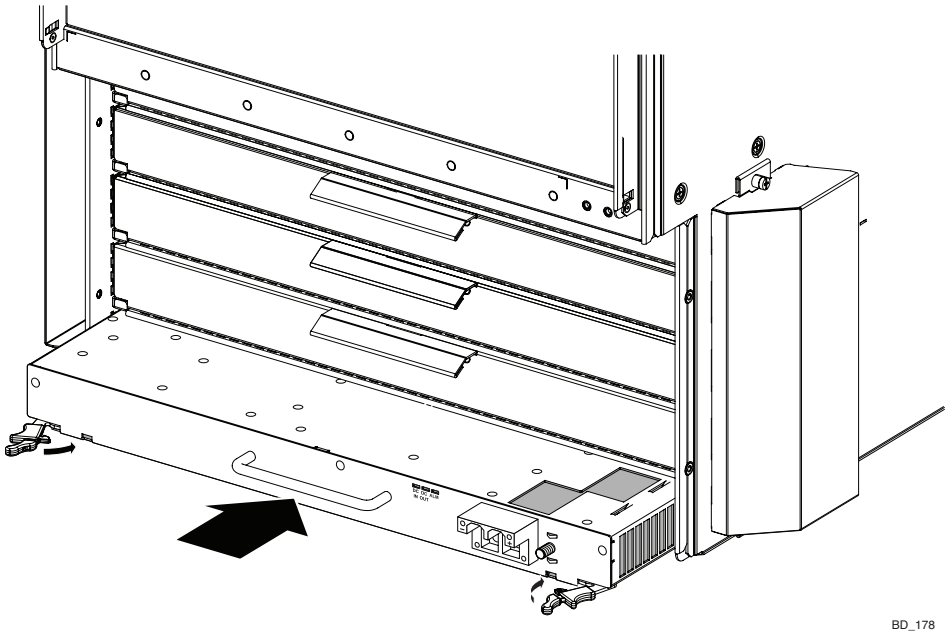
5 Support both sides of the PSU as you carefully slide the unit all the way into the power supply bay (see Figure 34).

CAUTION

Do not slam the PSU into the system switch backplane. Use the latches to secure the PSU into the chassis.

Figure 34: Inserting the 1900 W DC PSU into the Power Supply Bay



6 Secure the 1900 W DC PSU in the power supply bay by rotating the latches toward each other until the unit clicks into place.

   Make sure that both latches engage properly and that they both latch securely.

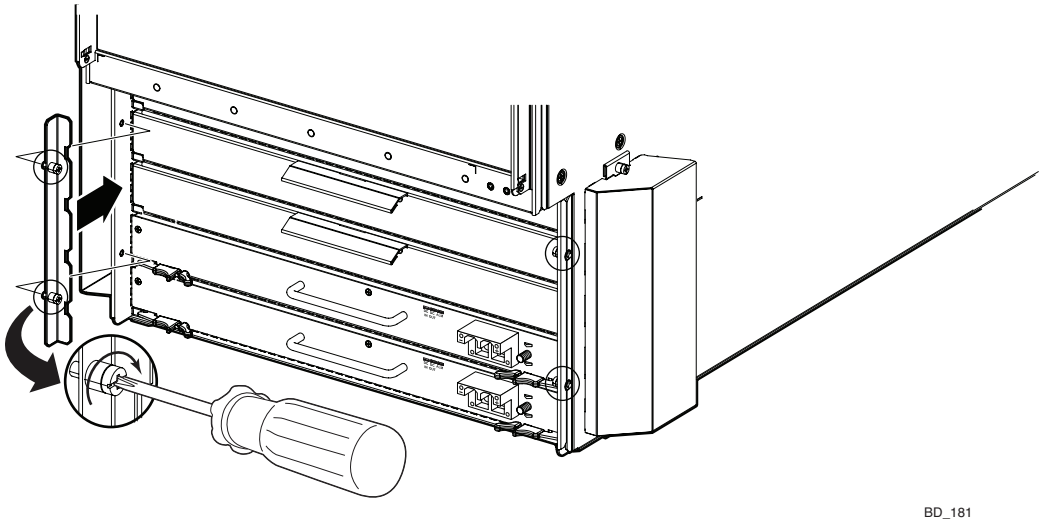
7 To install more PSUs, repeat steps 3 through 6.

8 After all the PSUs are installed, re-attach a power supply retainer on each side of the power supply bay as follows:

   a Set the retainer against the power supply with the rubber cushion toward the power supply and the captive retaining screws aligned with the side of the BlackDiamond 20808 chassis (see Figure 35).

   b Insert and fully tighten the captive retaining screws.

Figure 35: Attaching a Power Supply Retainer



Connecting the Ground Cable

WARNING!

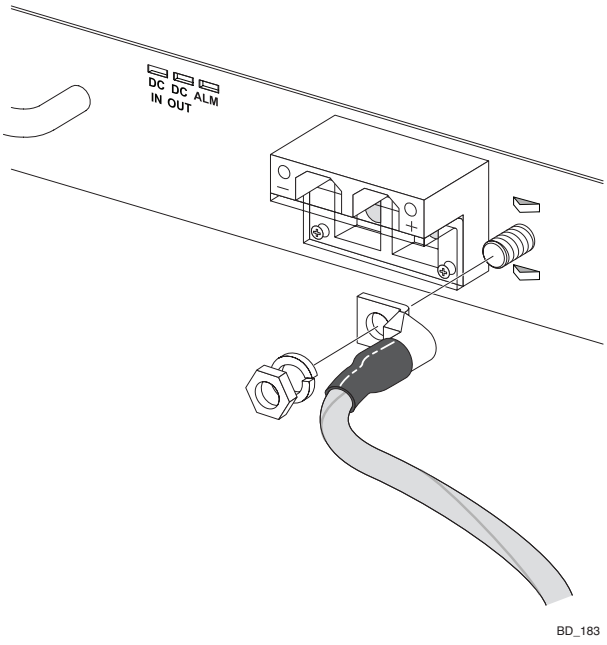
Be sure to connect the chassis ground wire before *you connect any power cables.*
Be sure to disconnect the ground wire after *you disconnect all power cables.*

You need a 3/8-inch driver to tighten the nut on the grounding post.

To connect the ground cables:

1. Verify that the DC circuit is de-energized.
2. Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle on the top right corner of the switch front panel.
3. Connect the ground as follows:
   a. Slide the lug on the green wire over the grounding post on the PSU (Figure 36).
   b. Attach the provided nut and lock washer to the grounding post and tighten them to 10 inch-pounds.
   c. Connect the other end of the wire to a known reliable earth ground point at your site.

Figure 36: Connecting the Ground Wire



Connecting the PSU to the DC Source Voltage

The DC power connection at your facility *must* be made by a qualified electrician, following the instructions in this section.

WARNING!

Always make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cables on the 1900 W DC PSU.

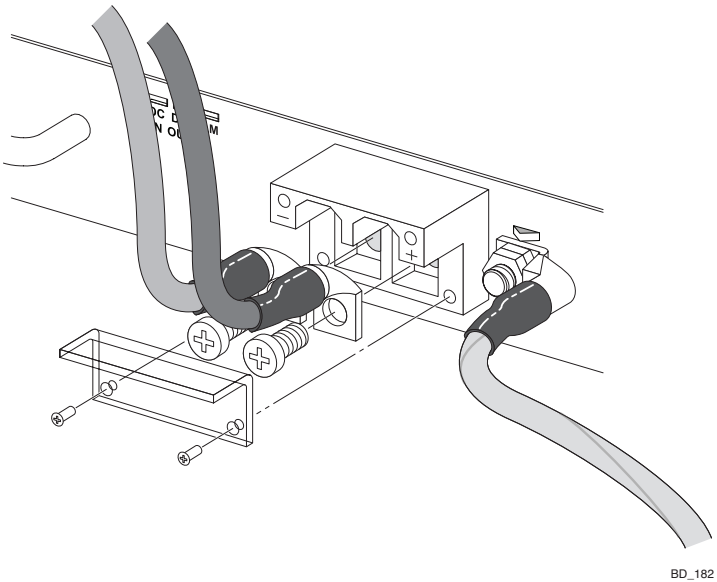
CAUTION

Provide proper connection and strain relief on the DC power cables in accordance with all local and national electrical codes.

To connect the DC power input cables:

1. Verify that the DC circuit is de-energized.
2. Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle on the top right corner of the switch front panel.
3. Remove the cover from the terminal block (Figure 37). Set the cover and screws in a safe place.
4. Connect the DC power input cables as follows:
   a. Using a provided screw, attach the red wire (–48 V) to the negative terminal (–).
   b. Using a provided screw, attach the black wire (–48 V RTN) to the positive terminal (+).
   c. Tighten both screws to 10 inch-pounds.
5. Place the cover over the terminal block and secure it using the provided screws.

Figure 37: Connecting the DC Power Cables



6 Connect the cables to the DC source voltage, using hardware appropriate to the installation site and following local and national electrical codes.

7 Energize the DC circuit.

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

Removing an Extreme Networks 1900 W DC PSU

WARNING!

Be sure to disconnect all power cables before *you disconnect the chassis ground wire.*

CAUTION

The DC PSU may be hot to the touch; use thermal protective gloves when handling the PSU during removal.

To remove an Extreme Networks 1900 W DC PSU:

1 De-energize the DC circuit.

2 Attach an ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle on the back of the chassis.

3 Disconnect the DC power cables as follows:

   a Remove the cover from the terminal block.

   b Remove the screws that secure the cable lugs to the terminal block.

   c Move the wires away from the PSU.

4 Disconnect the ground wire as follows:

   a Remove the nuts from the grounding post.

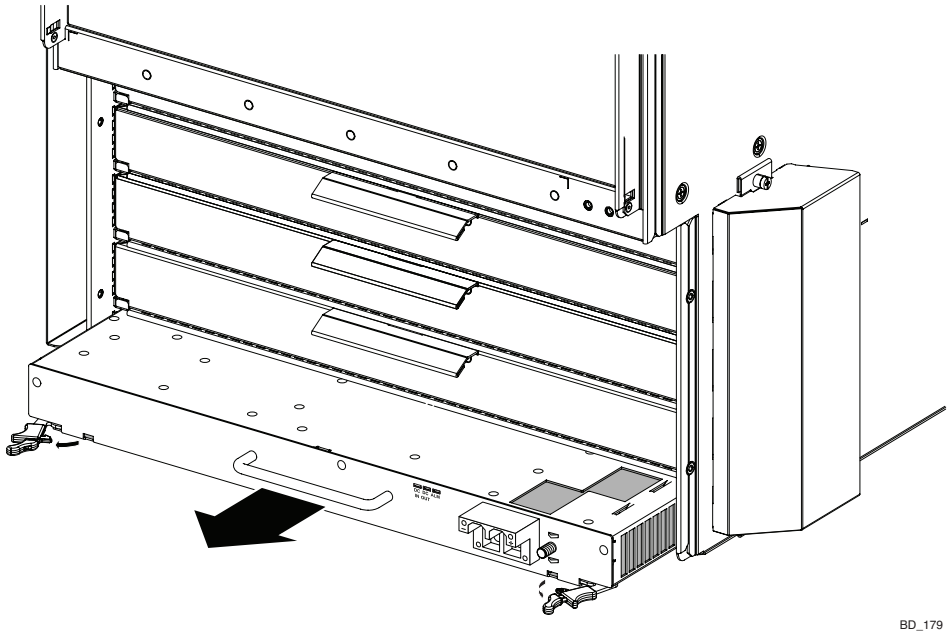
   b Pull the connection lug off the grounding post and move the wire away from the PSU.

5 At each side, completely loosen the captive retaining screws and remove the power supply retainers from the chassis.

6 Push the spring-loaded catch on each latch, and rotate the latches away from the front of the PSU to disconnect the unit from the chassis.

7 Use the handle to slide the PSU out of the chassis (Figure 38).
Be sure to support both sides of the PSU as you remove it from the chassis.

Figure 38: Removing a 1900 W DC PSU



8 If you are not installing a replacement PSU, install a PSU blank cover over the unoccupied slot.

Leave the ESD strap permanently connected to the switch, so that the strap is always available when you need to handle ESD-sensitive components.

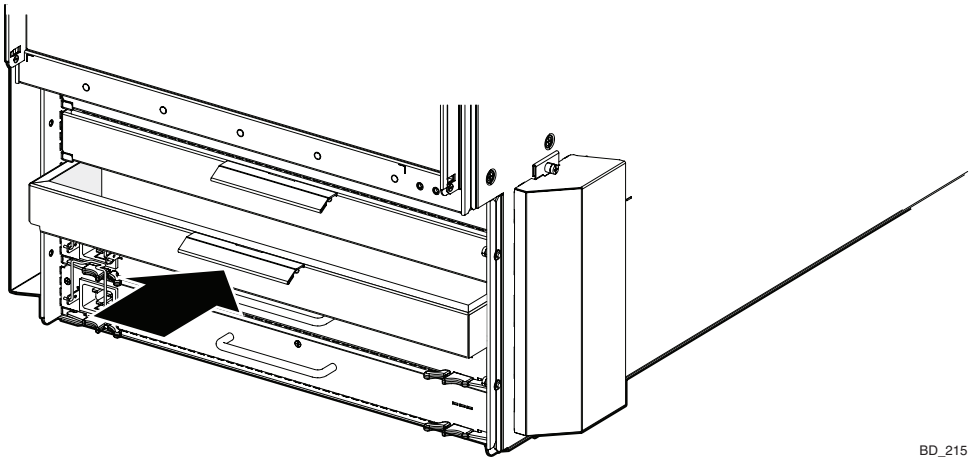
Installing a PSU Blank Slot Cover

All unoccupied chassis slots must be covered at all times to maintain proper system ventilation and EMI levels.

To install a blank slot cover over a PSU slot:

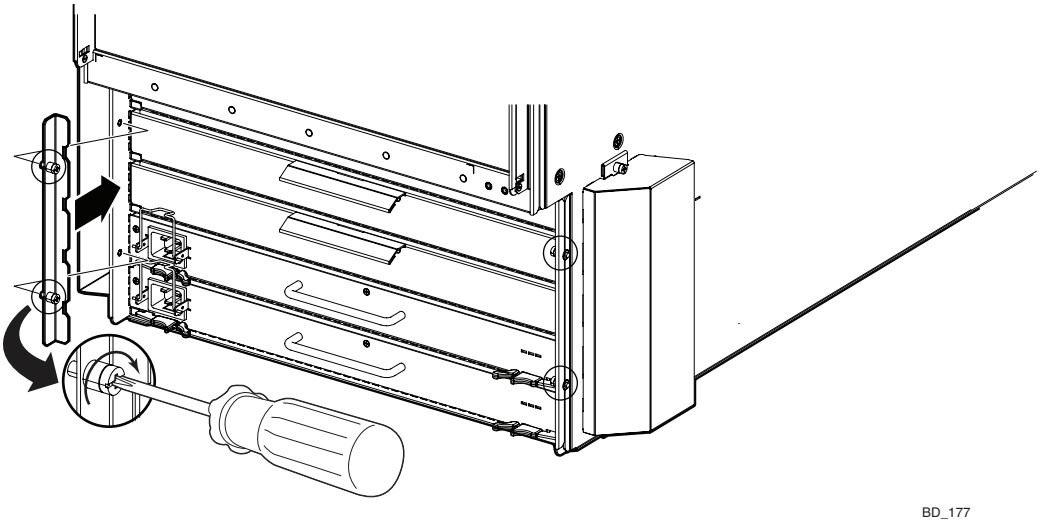
1 Make sure that the PSU retainers are removed from both sides.
2 Align the cover with the PSU slot and slide it into place (Figure 39).

Figure 39: Installing a PSU Slot Cover



3 Attach the PSU retainer at each side of the chassis (Figure 40

Figure 40: Attaching a PSU Retainer



7 Installing the BlackDiamond 20808 Modules

This chapter describes how to install management modules, I/O modules, and switch fabric modules in the BlackDiamond 20808 chassis. It also describes how to install module blanks in unpopulated chassis slots.

Management modules and I/O modules are installed in vertical module slots at the front ot the chassis. Switch Fabric modules are installed in horizontal module slots at the back of the chassis. Module blanks are available to cover all unpopulated module slots.

CAUTION

To ensure satisfactory protection from EMI and to maintain adequate airflow through the BlackDiamond 20808 switch, always make certain that all module slots contain either an installed module or a module blank. If you remove an installed module, you must install a replacement module or a module blank to ensure that the remaining modules continue to function correctly.

This chapter includes the following sections:

Required Tools

You need the following tools to install any module or module blank in the BlackDiamond 20808 chassis:

- ESD-preventive wrist strap
- #2 Phillips screwdriver

CAUTION

Install BlackDiamond 20800 series modules only in a BlackDiamond 20808 chassis.

Installing Management Modules and I/O Modules

All BlackDiamond 20808 I/O and management modules are hot-swappable. You do not need to power the system off to install or remove a BlackDiamond 20808 I/O or management module.

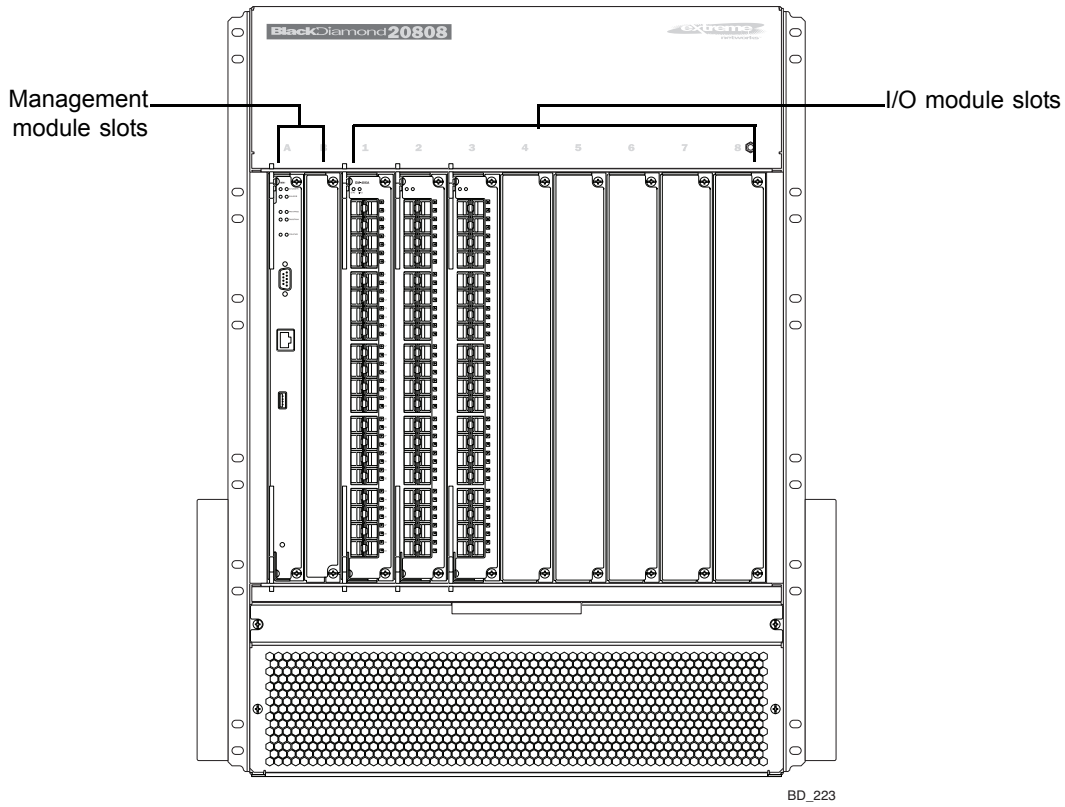
To install a module:

1 Attach the ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle on the top right corner of the chassis.

2 Identify the slot where the module will be installed (Figure 41).

- Management modules must be installed in slot A or B.
- I/O modules must be installed in one of the numbered slots.

Figure 41: Front Module Slots in the BlackDiamond 20808 Switch



3 If necessary, remove a module blank from the chassis slot.

NOTE

Save all module blanks for later re-use in case you must replace a defective module or reconfigure the switch with fewer active modules.

4 Remove the module from the anti-static packaging as follows:

a Place the ESD bag containing the module on a flat ESD surface that is clear of any debris.

b Break the quality seal, the ESD warning seal, and the Read Installation Note seal.

c Open the ESD bag and carefully remove the module.

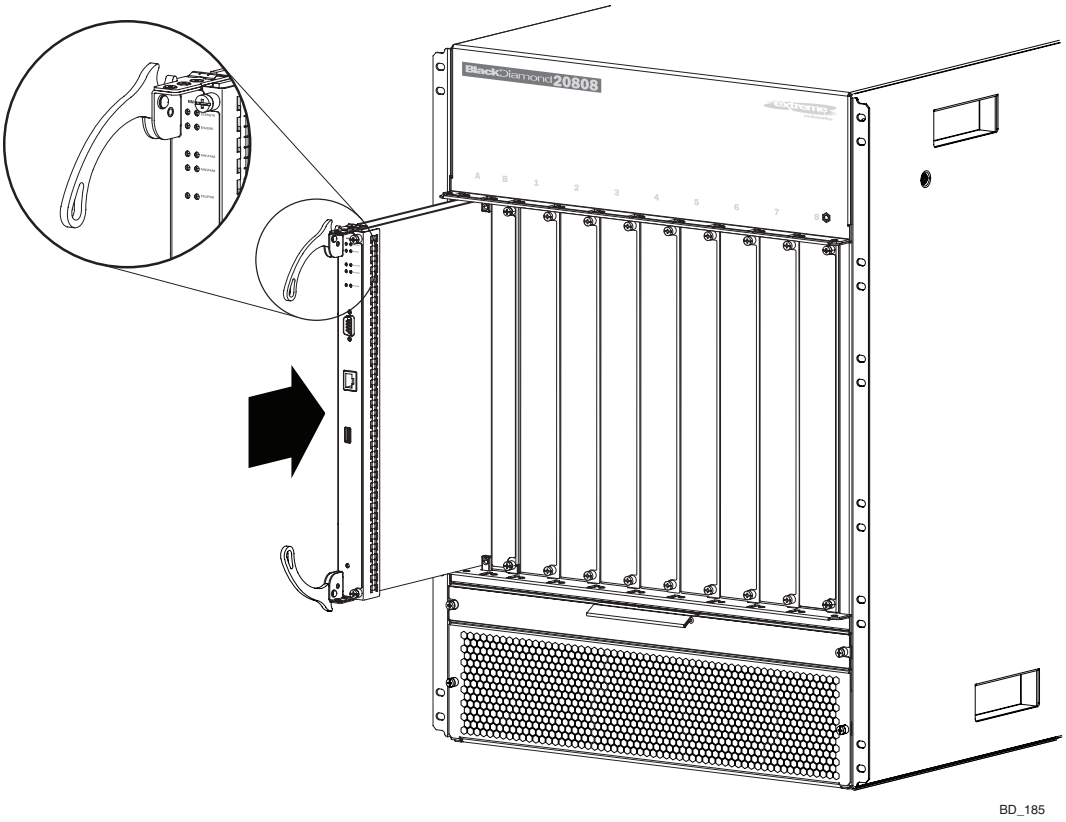
CAUTION

To prevent ESD damage, hold the module by the front panel only. Never touch the components on the PCB or the pins on any of the connectors.

5 Align the module with the card guides in the chassis, and keep the injector/ejector levers in the open position as you carefully slide the module partway into the chassis slot (see Figure 42).

6 Verify that the module injector/ejector levers are open (Figure 42).

Figure 42: Installing a Module (Management Module Shown)

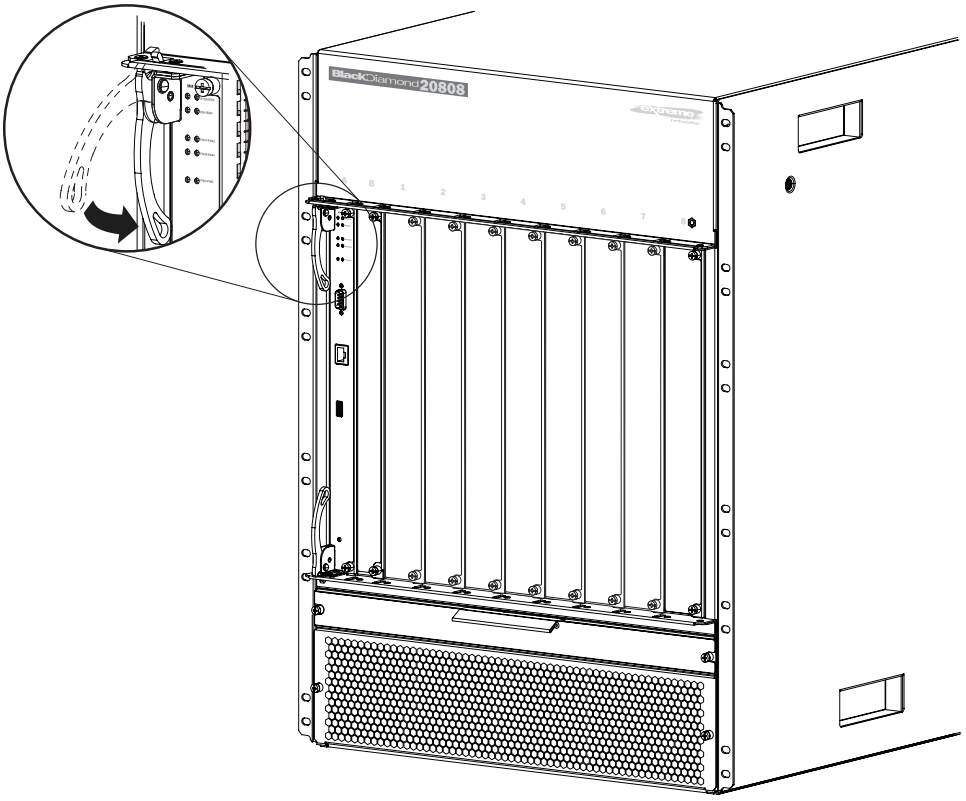


CAUTION

Do not slide the module all the way into the chassis slot if the injector/ejector levers are in the latched position.

7 When the module makes contact with the chassis backplane, simultaneously rotate both levers toward the center of the module to fully seat the module in the slot (Figure 43).

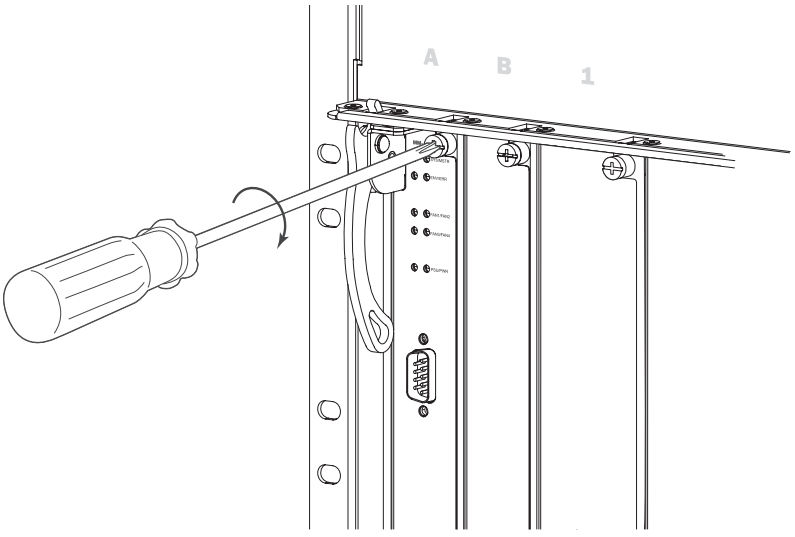
Figure 43: Seating a Module (Management Module Shown)



8 Using a # 2 Phillips screwdriver, align and tighten the captive retaining screws (Figure 44).

When you are installing multiple modules, always secure each installed module before you insert the next adjacent module.

Figure 44: Securing the Module



9 Store the module packaging for future use.

Leave the ESD-preventive wrist strap permanently connected to the chassis so that the strap is always available when you need to handle ESD-sensitive components.

For information about the module LEDs, see "Management Module LEDs" on page 20 and "I/O Module LEDs" on page 24.

Removing an I/O Module or Management Module

You need the following tools and equipment to remove a BlackDiamond 20800 series module:

- ESD-preventive wrist strap (if one is not already attached to the chassis)
- #2 Phillips screwdriver
- Anti-static packaging for the removed module
- Replacement module or module blank

CAUTION

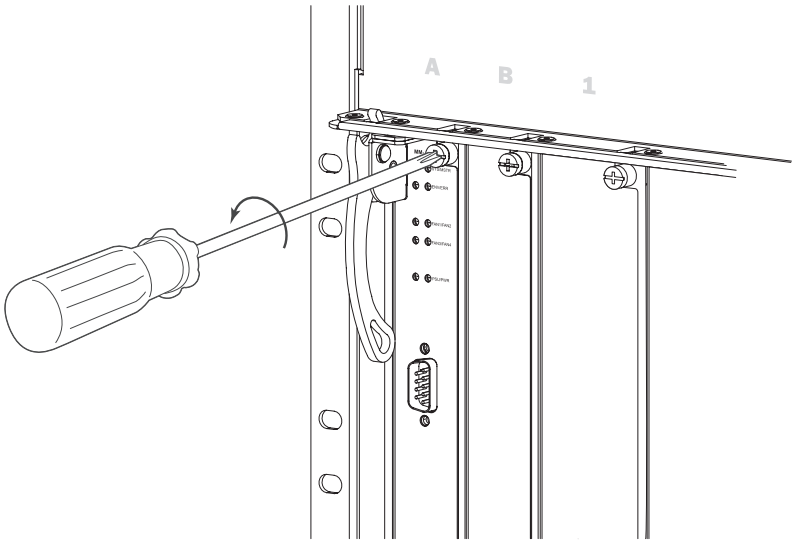
If you remove a module, you must install a replacement module or a module blank to ensure that the remaining modules continue to function correctly. All module slots must be occupied at all times for proper cooling and module operation.

To remove a BlackDiamond 20808 I/O module or management module:

1 Attach the ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle on the top left corner of the chassis.

2 Using a # 2 Phillips screwdriver, completely loosen the captive retaining screws (Figure 45).

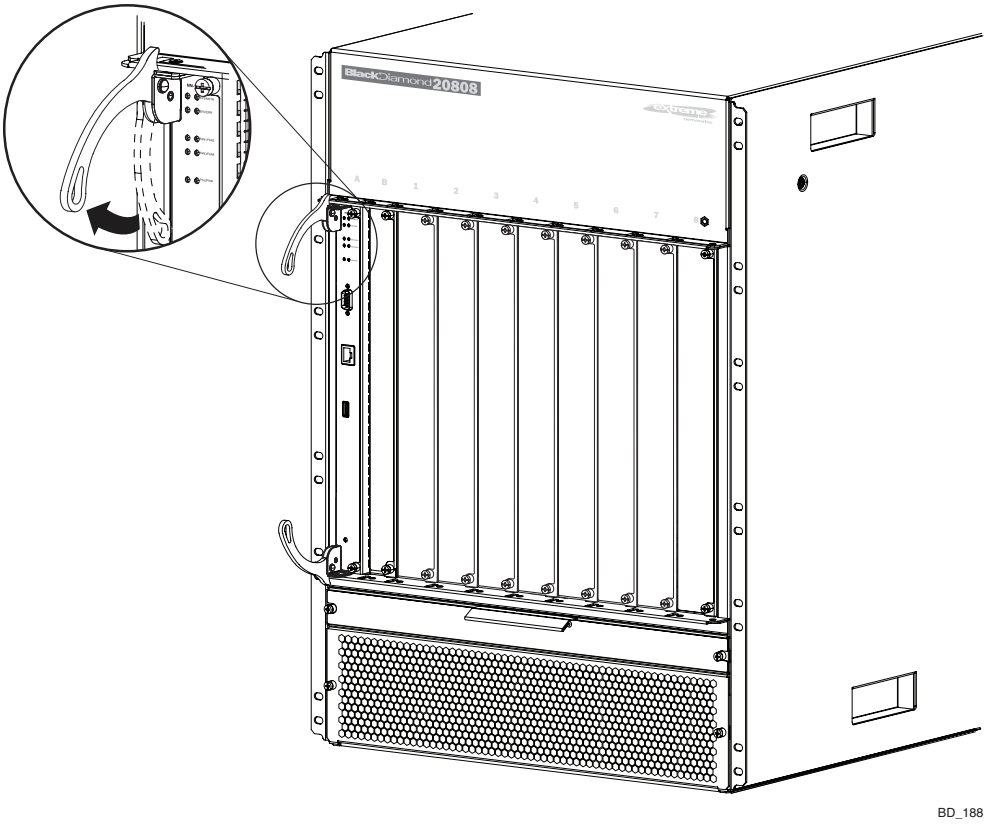
Figure 45: Loosening the Captive Retaining Screw



BD_190

3 Simultaneously rotate the injector/ejector levers away from each other to release the module from the chassis slot (Figure 46).

Figure 46: Unseating a Module (Management Module Shown)



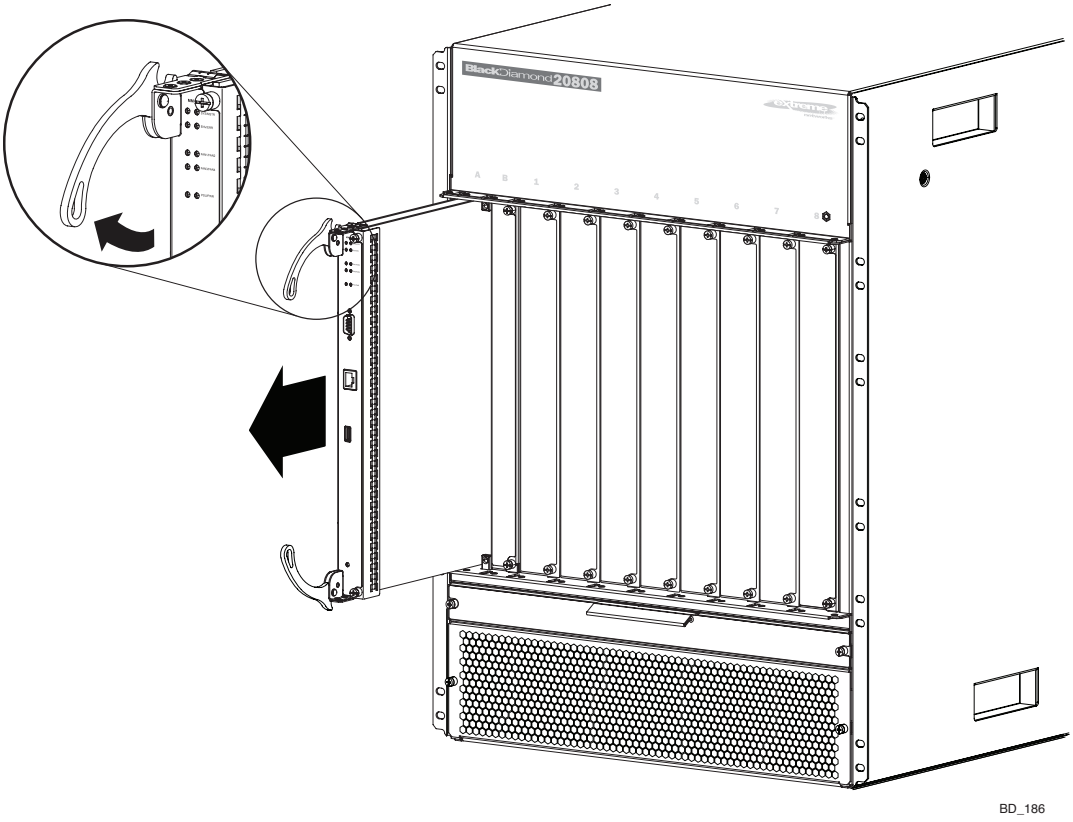
CAUTION

To prevent ESD damage, hold the module by the metal panel edges only. Never touch the components on the PCB or the pins on any of the connectors.

4 Carefully slide the module out of the chassis slot (Figure 47).

BlackDiamond modules are heavy. Support the bottom edge of the module as you pull it out of the chassis.

Figure 47: Removing a Module (Management Module Shown)



5 Place the module into the ESD bag to protect it from potential ESD damage. This will also prevent dust from collecting on the module connectors.

6 If a replacement module will not be installed in the chassis slot, install a module blank to ensure that the BlackDiamond20808 chassis maintains proper cooling.

For more information about installing module blanks, see "Installing I/O or Management Module Blanks" on page 80.

Leave the ESD-preventive wrist strap permanently connected to the chassis; this is to ensure that the strap is always available when you need to handle ESD-sensitive components.

Installing I/O or Management Module Blanks

To ensure satisfactory EMI levels and to maintain adequate airflow through the BlackDiamond 20808 switch, always make certain that all module slots contain either an installed module or a module blank. If you remove an installed module, you must install a replacement module or a module blank to ensure that the remaining modules continue to function correctly.

Save unused module blanks for later re-use in case you must replace a defective module or reconfigure the switch with fewer active modules.

You need a #2 Phillips screwdriver to install a module blank.

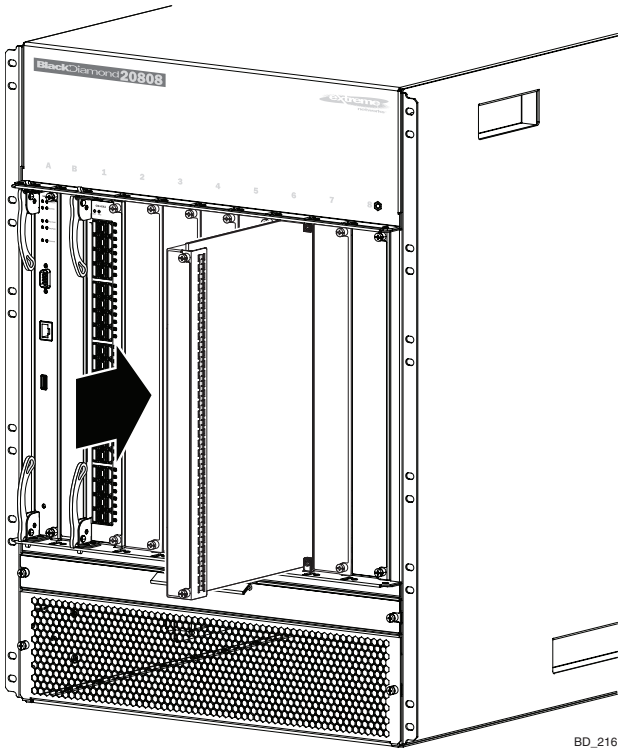
To install a module blank in a slot for a management module or I/O module:

1 Check the condition of the EMI gaskets along the front panel edges of the blank, and confirm that the gaskets are not damaged.

2 Holding the blank with the screws at the right, align the blank with the slot to be covered (Figure 48).

Make sure you have the correct blank for the slot. Management modules and I/O modules are different widths; the blanks for the two module types are not interchangeable.

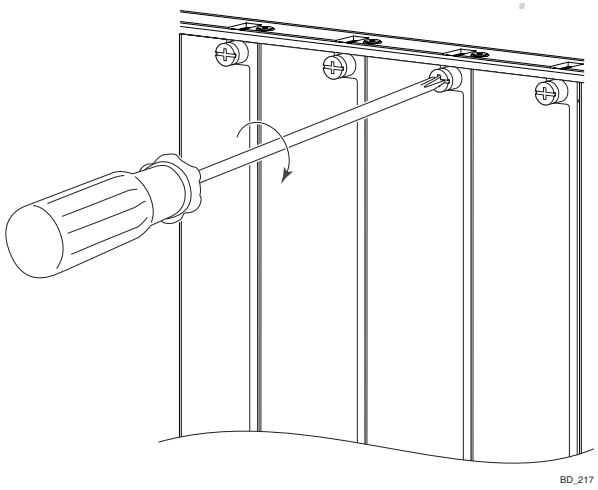
Figure 48: Installing a Module Blank



3 Slide the blank into the slot opening.

4 Align and tighten the retaining screws at the top and bottom of the front panel (Figure 49).

Figure 49: Securing a Module Blank



Installing Switch Fabric Modules

Five XFM-1 switch fabric modules are installed in dedicated slots at the rear of the BlackDiamond 20808 chassis.

To ensure proper cooling of the XFM-1 modules, always make certain that all five XFM-1 module slots contain either an XFM-1 module or an XFM-1 module blank. If you remove an installed XFM-1 module, you must install a replacement module or a module blank to ensure that the remaining modules continue to function correctly.

CAUTION

Install the XFM-1 module only in a BlackDiamond 20808 chassis.

To install an XFM-1 module:

1. Attach the ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle on the back of the chassis.
2. Identify the slot where the module will be installed.
3. If necessary, remove a blank panel from the chassis slot.

NOTE

Save unused XFM-1 module blanks, in case an XFM-1 module must be removed from the chassis later. Module slots must always be occupied by either an XFM-1 module or a module blank.

4 Remove the module from the anti-static packaging as follows:

a Place the ESD bag containing the module on a flat ESD surface that is clear of any debris.

b Break the quality seal, the ESD warning seal, and the Read Installation Note seal.

c Open the ESD bag and carefully remove the module.

CAUTION

To prevent ESD damage, hold the module by the front panel only. Never touch the components on the PCB or the pins on any of the connectors.

5 Verify that the module injector/ejector levers are open (Figure 50).

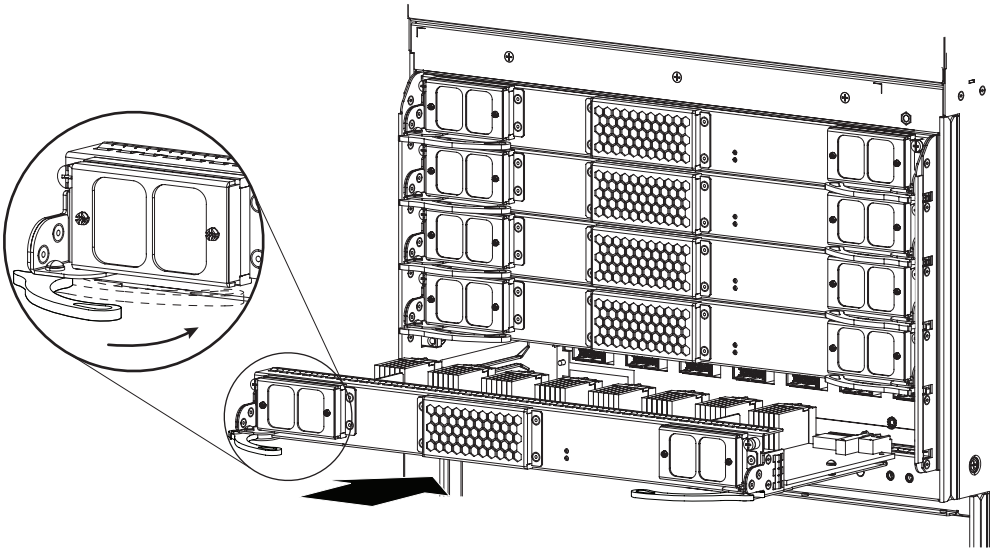
6 Align the module with the card guides in the chassis, and keep the injector/ejector levers in the open position as you carefully slide the module into the chassis slot (Figure 50).

CAUTION

Do not slide the module all the way into the chassis slot if the injector/ejector levers are in the latched position.

7 When the module makes contact with the backplane, simultaneously rotate both levers toward the center of the module to fully seat the module in the slot (Figure 50).

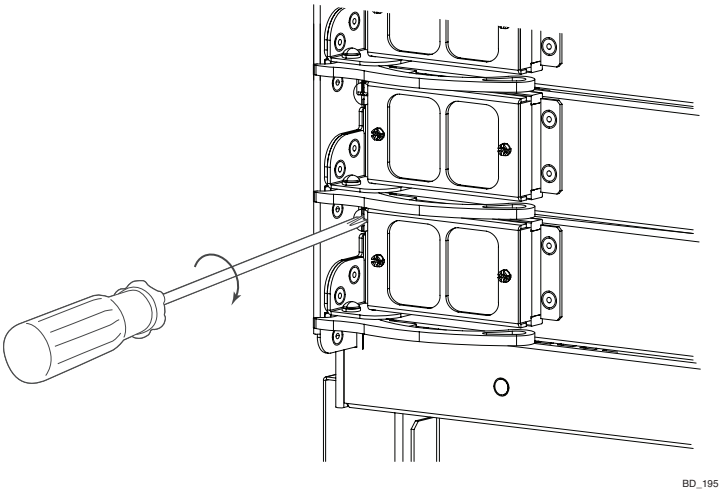
Figure 50: Installing a Switch Fabric Module



8 Using a # 2 Phillips screwdriver, align and tighten the captive retaining screws (Figure 51).

When you install multiple XFM-1 modules, always secure each installed module before you insert the next adjacent module.

Figure 51: Securing the Switch Fabric Module



9 Store the module packaging for future use.

Leave the ESD-preventive wrist strap permanently connected to the chassis so that the strap is always available when you need to handle ESD-sensitive components.

Removing a Switch Fabric Module

You need the following tools and equipment to remove a switch fabric module:

- ESD-preventive wrist strap (if one is not already attached to the chassis)
- #2 Phillips screwdriver
- Anti-static packaging for the removed module
- Replacement XFM-1 module or XFM-1 module blank

CAUTION

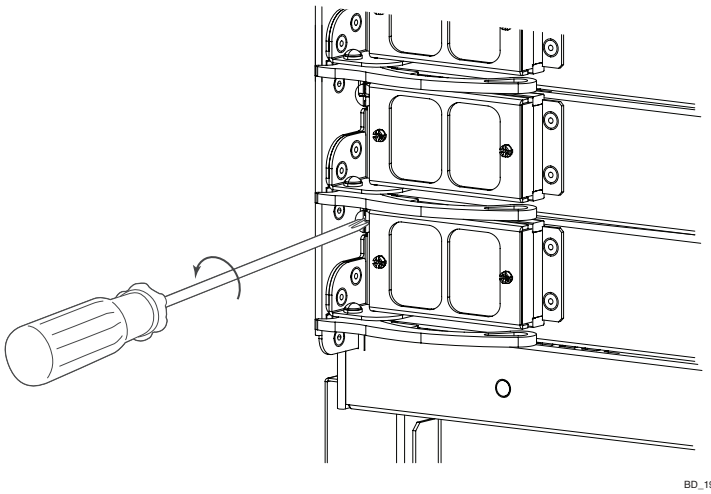
If you remove an XFM-1 module, you must install a replacement module or a module blank to ensure that the remaining modules continue to function correctly. All five module slots must be occupied at all times for proper cooling and module operation.

To remove an XFM-1 module:

1 Attach the ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle on the back of the chassis.

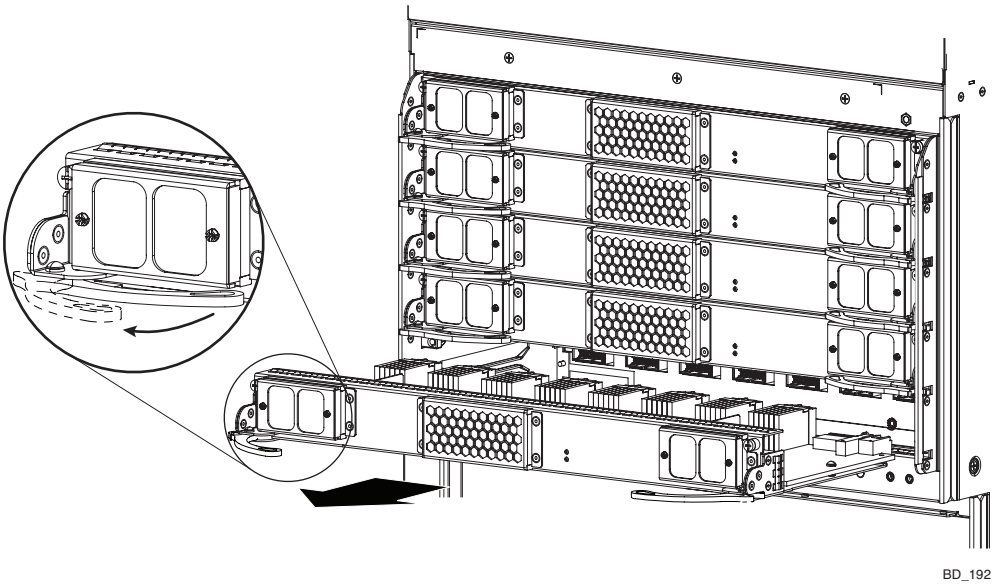
2 Using a # 2 Phillips screwdriver, completely loosen the captive retaining screws (Figure 52).

Figure 52: Loosening the Retaining Screws on the Switch Fabric Module



3 Simultaneously rotate the injector/ejector levers away from each other to release the module from the chassis slot (Figure 53).

Figure 53: Removing a Switch Fabric Module



CAUTION

To prevent ESD damage, hold the module by the metal panel edges only. Never touch the components on the PCB or the pins on any of the connectors.

4 Carefully slide the module out of the chassis slot.

5 Place the module into the ESD bag to protect it from potential ESD damage. This will also prevent dust from collecting on the module connectors.

6 If a replacement module will not be installed in the chassis slot, install a blank panel to ensure that the BlackDiamond20808 chassis maintains proper cooling.

Leave the ESD-preventive wrist strap permanently connected to the chassis; this is to ensure that the strap is always available when you need to handle ESD-sensitive components.

Installing Switch Fabric Module Blanks

To ensure proper cooling of the XFM-1 modules, always make certain that all five XFM-1 module slots contain either an XFM-1 module or an XFM-1 module blank. If you remove an XFM-1 module, you must install a replacement module or a module blank to ensure that the remaining modules continue to function correctly.

Save all unused module blanks for later re-use in case you must replace a defective module or reconfigure the switch with fewer active modules.

You need a #2 Phillips screwdriver to install an XFM-1 module blank.

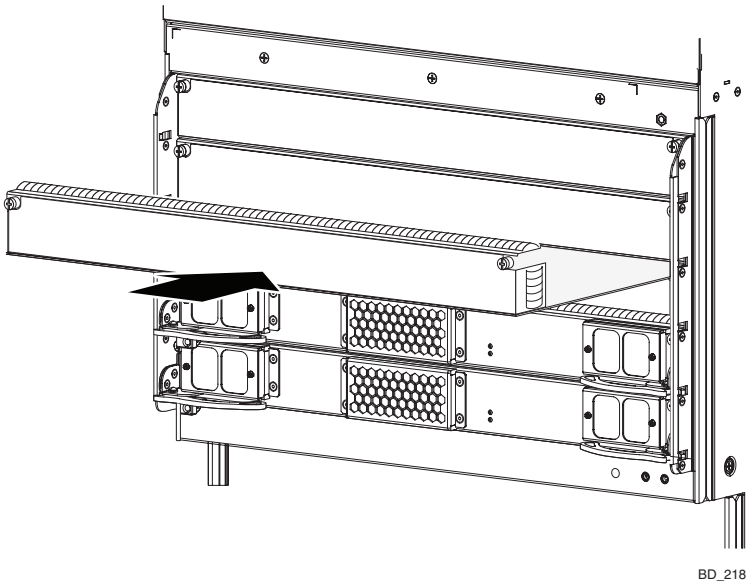
To install a switch fabric module blank:

1 Check the condition of the EMI gaskets along the front panel edges of the blank, and confirm that the gaskets are not damaged.

2 Align the blank with the module slot and slide the blank into place (Figure 54).

3 Using a #2 Phillips screwdriver, align and tighten the captive retaining screws.

Figure 54: Installing a Switch Fabric Module Blank



3 Maintenance Procedures

8 Packing the BlackDiamond 20808 Chassis for Shipping

This chapter describes how to pack the BlackDiamond 20808 chassis for shipment back to Extreme Networks.

This chapter includes the following sections:

Required Tools and Materials

You need the following tools and materials to pack a BlackDiamond 20808 chassis:

- Original shipping box and packing materials
- Nut driver for disconnecting the ground wire if DC power supplies are installed
- Four rack-mounting screws for attaching the helper bracket to the rack
- #2 Phillips screwdriver for removing the chassis from the rack
- Nylon package strapping material and a crimping tool

Removing the Chassis from the Rack

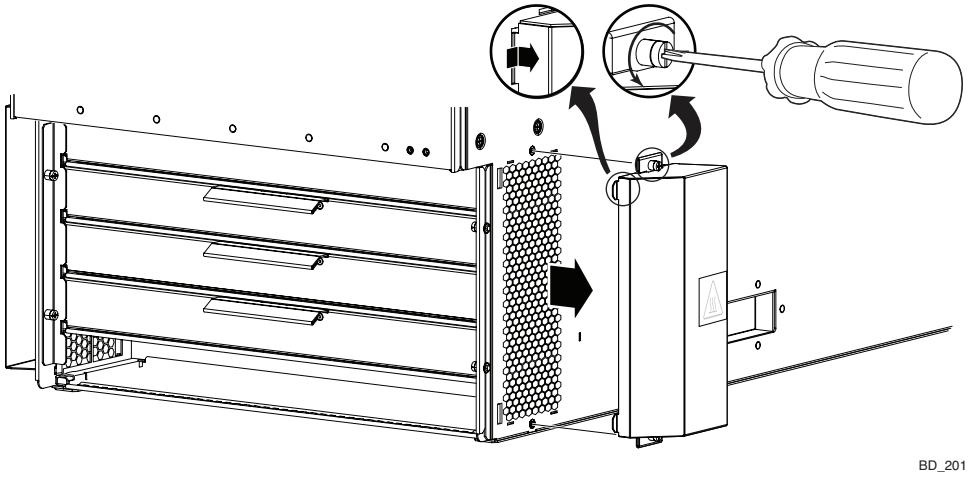
Before you begin, place the lower packing foam into the shipping pallet. Set the pallet with the foam in a convenient, stable location near the equipment rack.

To remove the chassis from the rack:

1. To prepare the chassis for removal from the rack, remove the installed modular components:
   a. Turn off the power to the chassis and remove the installed power supplies.
      - For instructions to remove an AC power supply, see "Removing an Extreme Networks 2400 W AC PSU" on page 63.
      - For instructions to remove a DC power supply, see "Removing an Extreme Networks 1900 W DC PSU" on page 70.
   b. Remove all the installed modules.
      - For instructions to remove I/O modules and management modules, see "Removing an I/O Module or Management Module" on page 77.
      - For instructions to remove switch fabric modules, see "Removing a Switch Fabric Module" on page 83.
2. Remove the air baffles from the sides of the chassis (Figure 55):
   a. On each baffle, use a #2 Phillips screwdriver to completely loosen the captive retaining screws at the top and bottom of the baffle.
   b. Slide the baffle toward its open side to disengage the locking tabs.

c Rotate the open side of the baffle away from the side of the chassis and slip the back edge tabs out of the side air intake grill.

Figure 55: Removing an Air Baffle



3 If necessary, attach the 19-inch support bracket to the equipment rack immediately below the chassis.

4 Remove the chassis from the rack:

a Remove the rack mounting screws that secure the chassis to the rack.

b Carefully slide the chassis out of the rack and set it on the pallet, nested in the lower packing foam.

Assembling the Shipping Container

To assemble the packaging around the chassis:

1 Slide the box down over the chassis and onto the pallet.

2 Set the upper packing foam in place on top of the chassis in the box.

3 Package the air baffles and set them on top of the chassis between the pieces of the upper packing foam.

4 Close the top flaps on the shipping box and seal them with packing tap

5 Use package strapping to secure the upper box to the pallet.

9 Cable Management Accessories

The BlackDiamond cable manager, cable holders, and cable clips provide a way to organize and contain masses of cables connected to a BlackDiamond switch. This chapter describes how to install and use these cable management accessories.

This chapter includes the following sections:

About BlackDiamond Cable Management

The BlackDiamond cable manager is a rack-mounted case that provides channels for routing cable bundles above the chassis. Interlocking cable holders and cable clips provide additional free-standing, rigid structural support for individual cables and cable bundles in front of the switch. You can use the cable holders and cable clips individually or connect them together to manage multiple cable bundles.

The cable management accessories keep cables collected in one place, rather than all just hanging free. If you must remove a module from the chassis for replacement or repair, the cable clips and holders maintain the cable arrangement in front of the chassis for ease of connection when you reinsert the module.

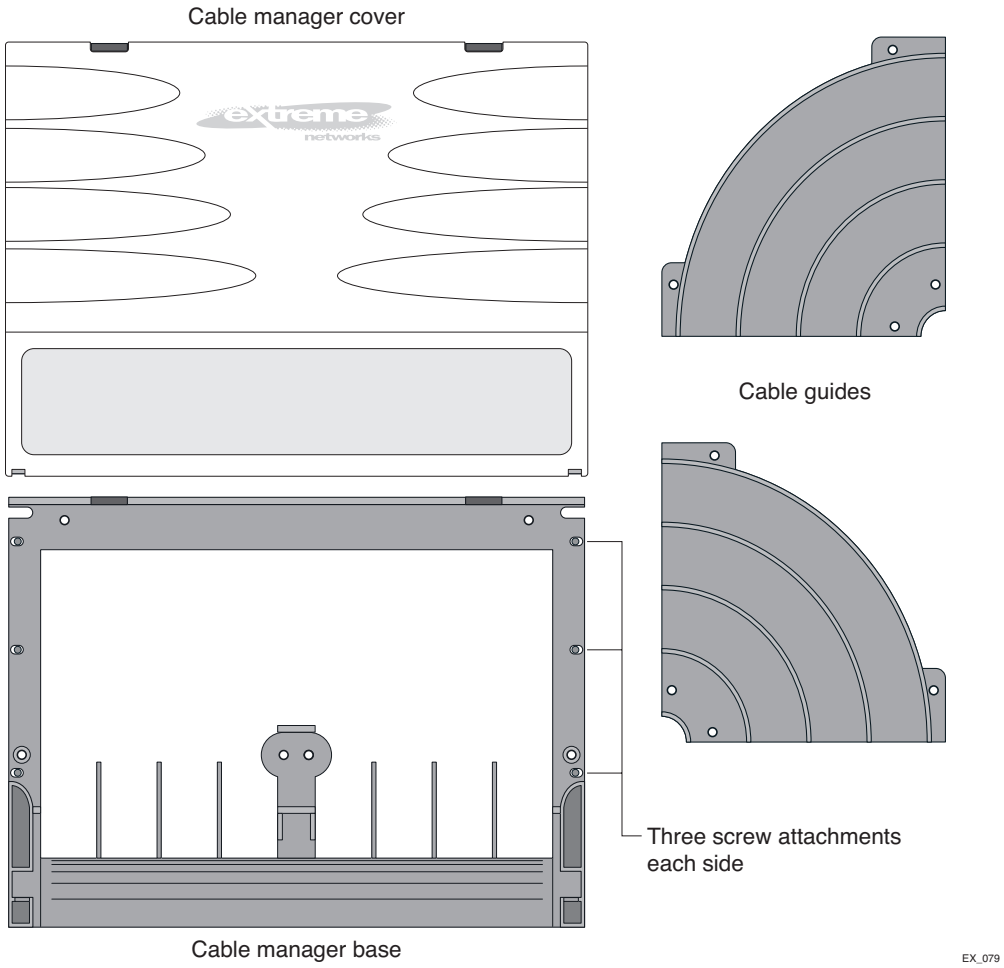
Installing the BlackDiamond Cable Manager

You need the following tools and equipment to install the cable manager:

- #2 Phillips screwdriver
- Six rack-mounting screws appropriate for your organization's rack system
- Screwdriver suitable for the rack-mounting screws

The BlackDiamond cable manager consists three parts: the mounting base, the cable guides, and a cover (see Figure 56).

Figure 56: Cable Manager Components



The cable manager is shipped assembled. You must remove the cover and the cable guides in order to attach the cable manager base to the rack.

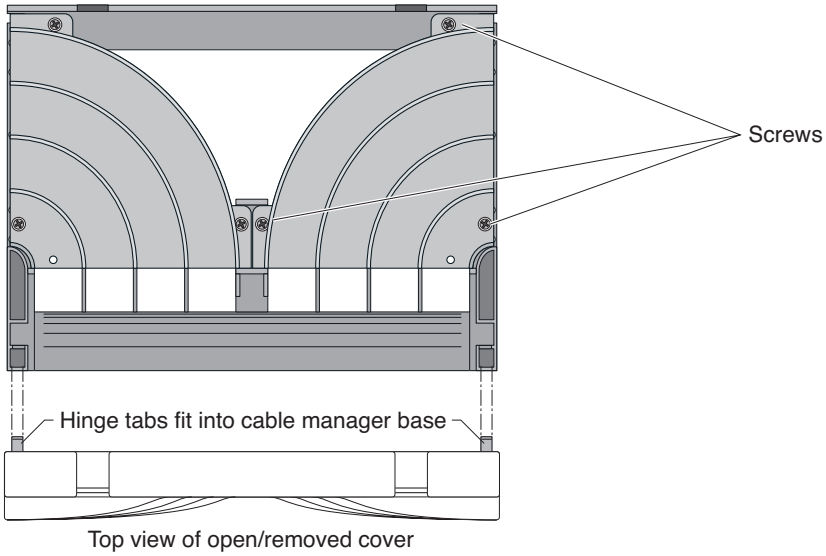
To install the cable manager:

1 At the top of the cover, lift the latches as you pull out on the corners to open the cover.

2 Rotate the cover outward and lift it off the base.

Removing the cover exposes the six screws holding the cable guides onto the mounting base (see Figure 57).

Figure 57: Cable Guide Screw Locations



3 Remove the six screws that secure the cable guides to the mounting base. Save the screws for reattaching the guides later.

4 Set the cable manager mounting base against the rack above the installed BlackDiamond 10808 chassis.

Adjust the height of the cable manager base as needed to ensure proper alignment of the screw holes. The distance between the top of the chassis and the cable manager base will be approximately 1/4 inch (6 mm) to 7/8 inch (20 mm).

5 Use six rack-mounting screws (not supplied) to mount the base onto the rack, as follows:

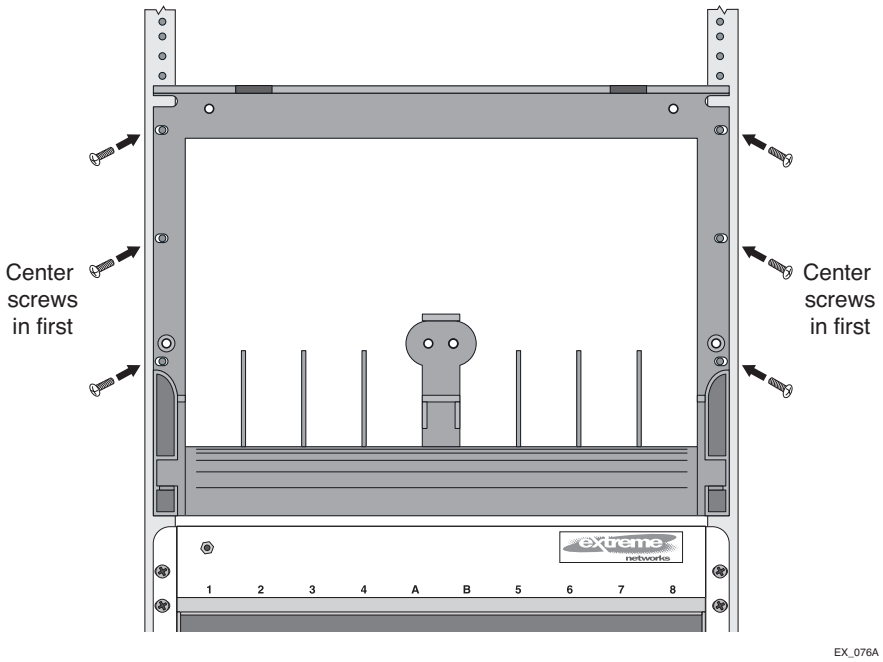
a On each side, insert the center screw first and partially tighten it (see Figure 58).

b Insert the remaining screws.

c Tighten all six screws securely.

Be sure that the screws do not protrude from the cable manager mounting base and prevent the cable guides from fitting properly over the base.

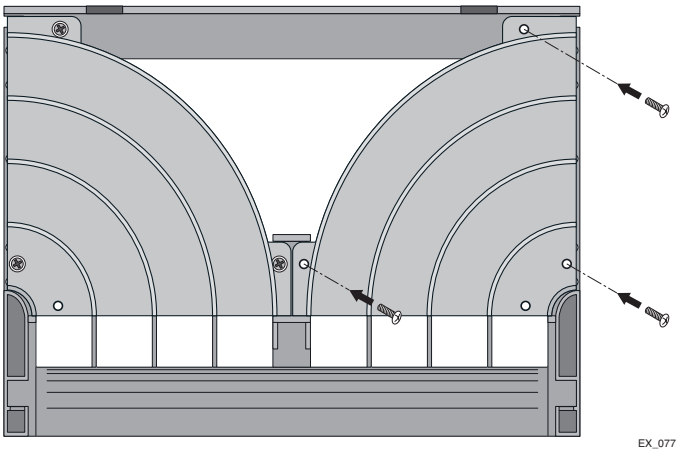
Figure 58: Attaching the Cable Manager Base to the Rack



6 Reattach the cable guides to the cable manager mounting base using the screws you removed previously (see Figure 59).

Do not over-tighten the screws.

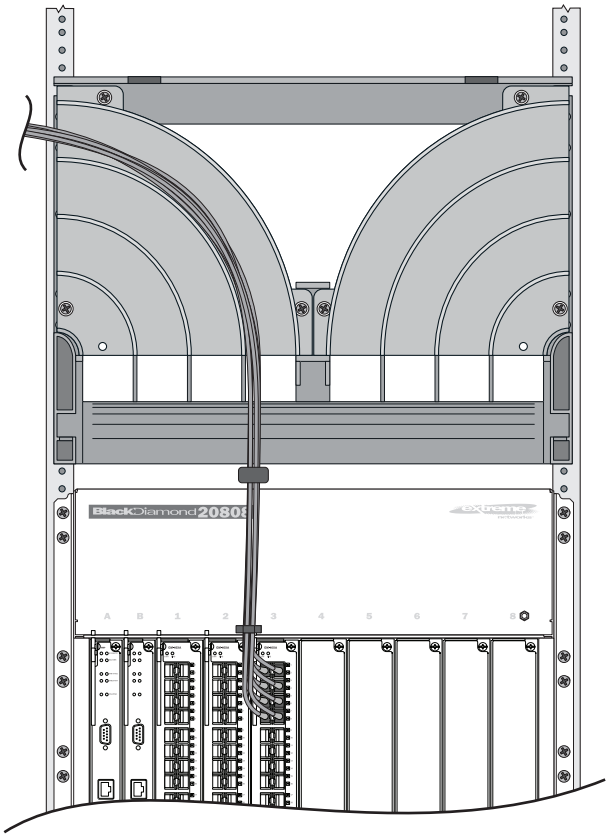
Figure 59: Securing the Cable Guides to the Mounted Cable Manager Base



7 Route bundled cables through the channels in the cable guides, as shown in Figure 60.

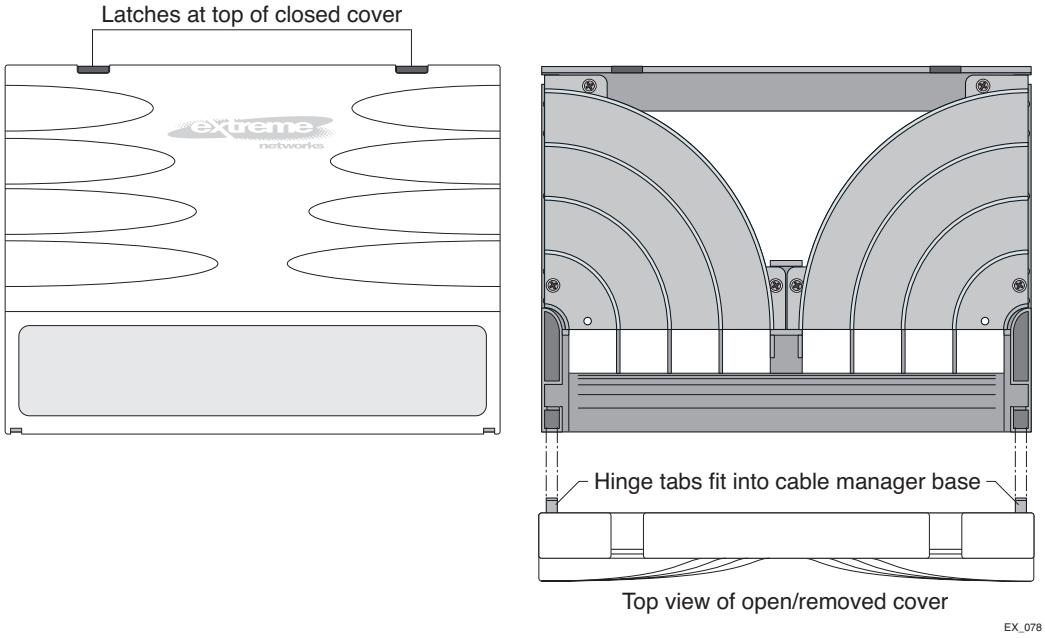
Use the cable holders and cable clips to organize and bundle the cables, as described in "Using the Cable Holders and Cable Clips" on page 96.

Figure 60: Using the Cable Manager



8 Set the bottom edge of the cover on the hinge tabs of the cable manager base (see Figure 61). Rotate the cover into place and press firmly at the top until the latches lock.

Figure 61: Cable Manager Cover Plate



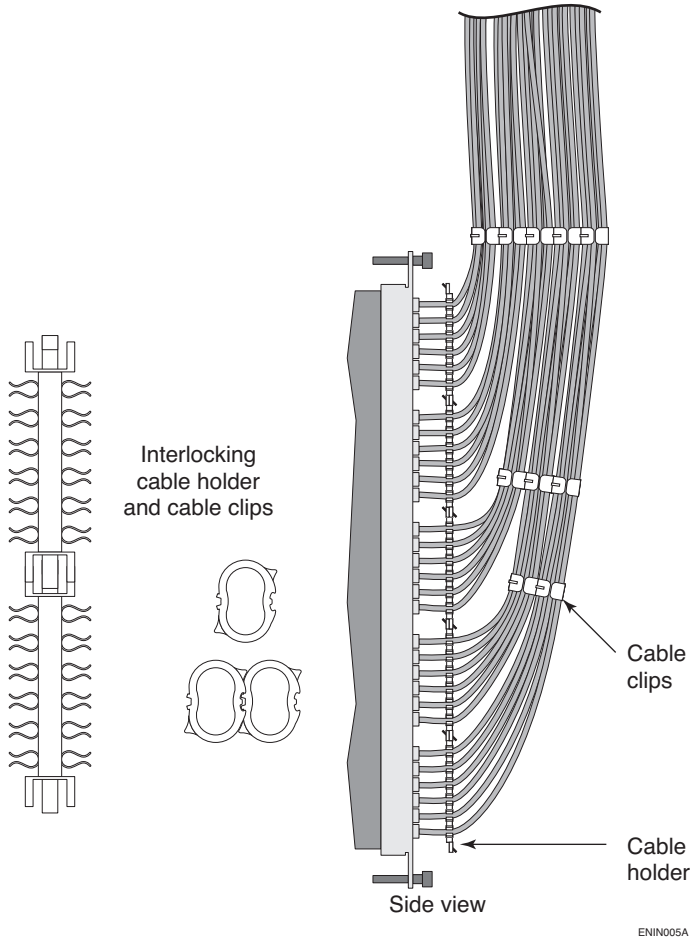
Using the Cable Holders and Cable Clips

When you use the cable holders and the cable clips, Extreme Networks recommends the following:

- Attach the cables to the holders by slipping the cable through the opening.
- Connect the cable holders, if you need more than one. (Refer to "Connecting Cable Holders" on page 97.)
- If you need more than one cable clip for a bundle, connect the clips together before you route the cables through the clips. (Refer to "Connecting Cable Clips" on page 98.)
- To form a cable bundle, thread the cables through the clips.

Figure 62 shows the cable holders and clips being used to manage a group of cables.

Figure 62: BlackDiamond Cable Holders and Clips



Connecting Cable Holders

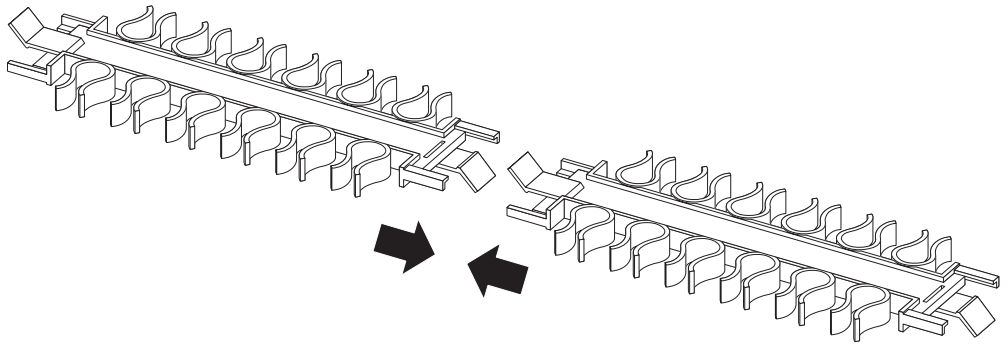
Each cable holder holds up to 12 separate cables, with 6 on each side. Connect cable holders end to end as needed to accommodate the number of cables you need to organize.

To connect the cable holders:

1 Hold two cable holders as shown in Figure 63.

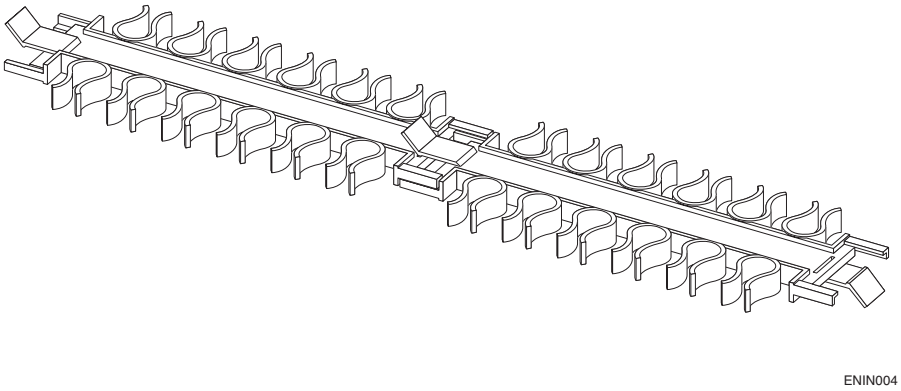
Make sure that one locking tab at the joint is on top and the other is on the bottom.

Figure 63: Connecting Cable Holders



2 Slide the ends together and push the cable holders together until you feel them snap into place (see Figure 64).

Figure 64: Connected Cable Holders



3 Connect as many cable holders together as you need to manage your cable bundles.

4 To disconnect the holders, grasp one in each hand firmly and carefully pull them apart.

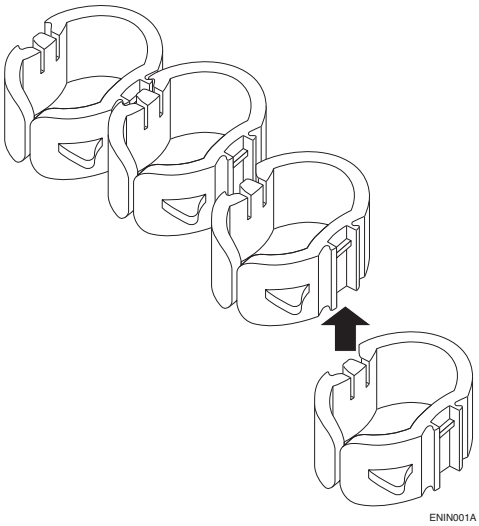
Connecting Cable Clips

To connect the cable clips:

1 Hold two clips next to each other with the split sides facing the same way (see Figure 65).

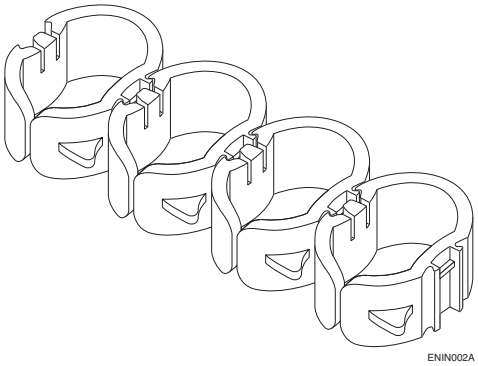
2 Slide the connecting grooves together (see Figure 65).

Figure 65: Connecting Cable Clips



3 Press the clips together until l the connectors lock into place (see Figure 66).

Figure 66: Cable Clip Chain



4 Connect as many cable clips together as you need to manage your cable bundles.

5 To disconnect the cable clips, push on the bottom ring while holding the top ring steady.

10 Replacing Ventilation and Airflow Components

This chapter describes how to replace fan trays, air filters, and PSU air baffles in the BlackDiamond 20808 Chassis.

This chapter includes the following sections:

Required Tools

You need the following tools to replace ventilation and airflow components in the BlackDiamond 20808 switch:

- ESD-preventive wrist strap (for fan tray only)
- # 2 Phillips screwdriver
- # 1 Phillips screwdriver for adjusting the side rails on a rear-installed fan tray
- Thermal protective gloves for handling PSU air baffles

Replacing a Fan Tray

The BlackDiamond 20808 switch is cooled by two fan trays, each containing 12 fans. The front fan tray is immediately below the management modules and I/O modules. The rear fan is above the switch fabric modules.

You can replace one fan tray without powering down the switch.

Make sure you have the replacement fan tray ready before you begin the replacement procedure.

Replacing the Front Fan Tray

To replace the front fan tray:

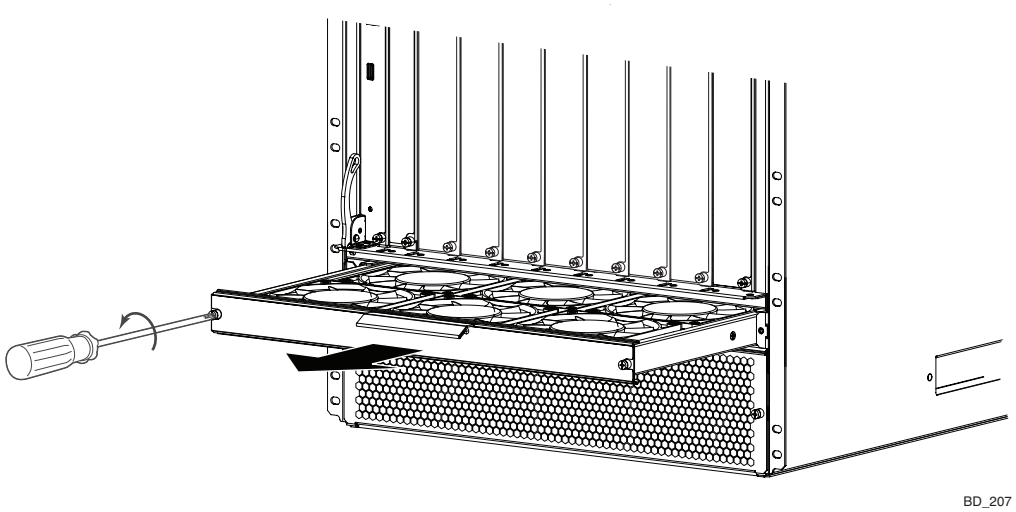
1. Attach the ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle above slot 8.
2. Remove the failed fan tray:
   a. Loosen the captive retaining screws on the failed fan tray (Figure 67).
   b. Wait at least 30 seconds for the fans to slow their rotation.

CAUTION

Be careful to keep your fingers away from the rotating fan blades as you remove the fan tray from the chassis.

c Carefully slide the fan tray out of the switch chassis (Figure 67). Be sure to support both sides of the fan tray as you pull it free of the chassis.

Figure 67: Removing the Fan Tray

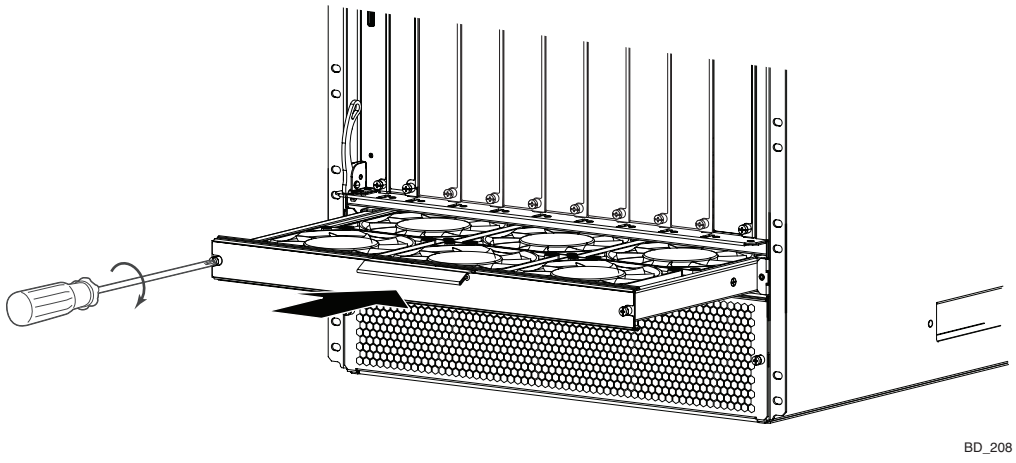


3 Install the replacement fan tray (Figure 68):

a Align the replacement tray with the opening in the chassis, and carefully slide the fan tray into the chassis.

b Align and tighten the captive retaining screws.

Figure 68: Installing the Fan Tray



Replacing the Rear Fan Tray

To replace the rear fan tray:

1 Set the replacement fan tray on a secure work surface.

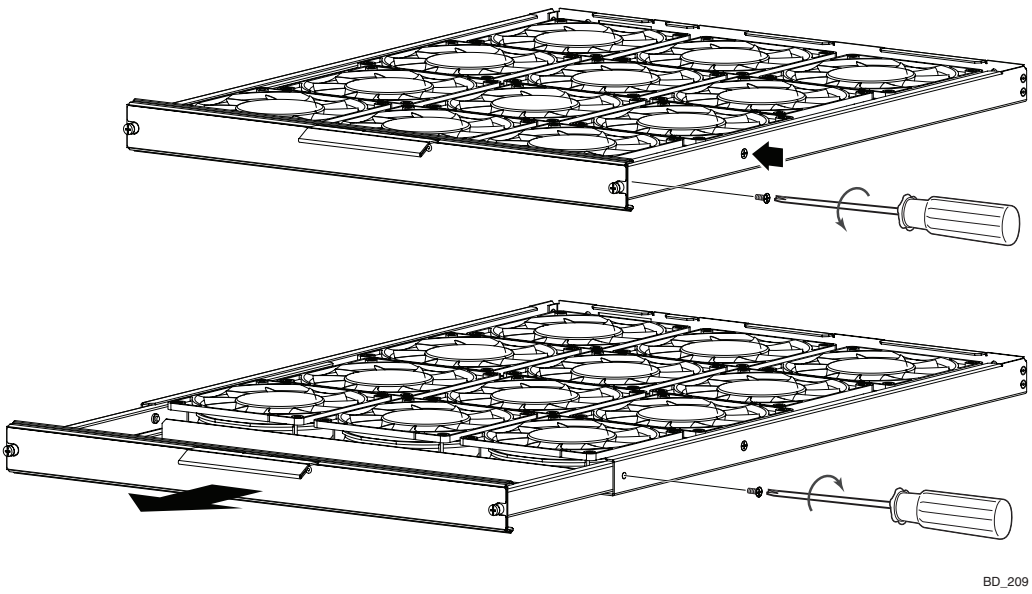
2 Extend the side rails (Figure 69):

   a On each side of the fan tray, remove the screws holding the side rails in position.

   b Holding the faceplate of the fan tray, pull the inner rails out until the two rear holes on the inner rail are aligned with the two holes on the outer rail.

   c Re-insert the screws to hold the side rails in the extended position.

Figure 69: Extending the Side Rails



3 Attach the ESD-preventive wrist strap to your bare wrist and connect the metal end to the ground receptacle below the right end of the fan tray front panel.

4 Remove the failed fan tray (Figure 70):

   a Completely loosen the captive retaining screws.

   b Pull the fan tray a few inches out ot the chassis.

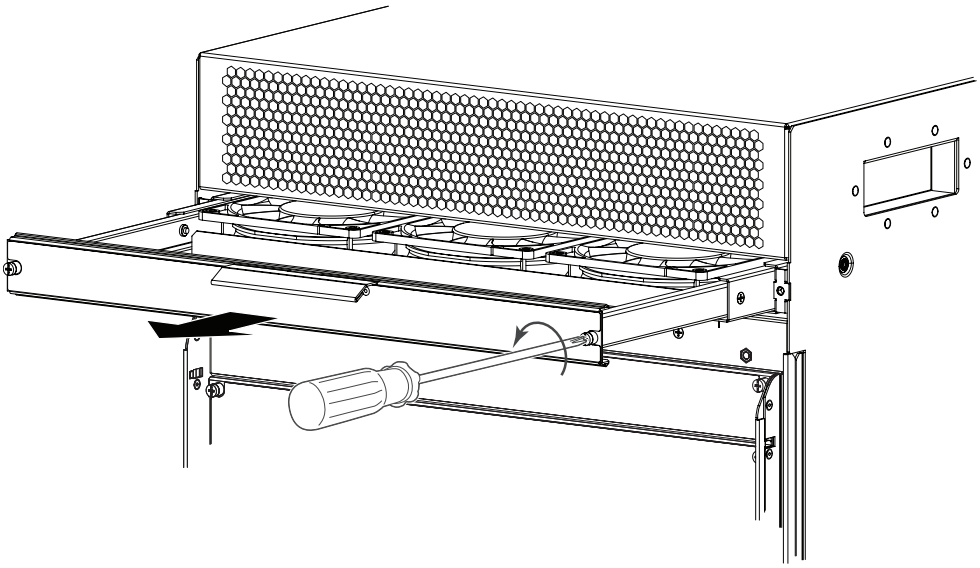
   c Wait at least 30 seconds for the fans to slow their rotation.

CAUTION

Be careful to keep your fingers away from the rotating fan blades as you remove the fan tray from the chassis.

   d Carefully slide the fan tray out of the switch chassis. Be sure to support both sides of the fan tray as you pull it free of the chassis.

Figure 70: Removing the Fan Tray

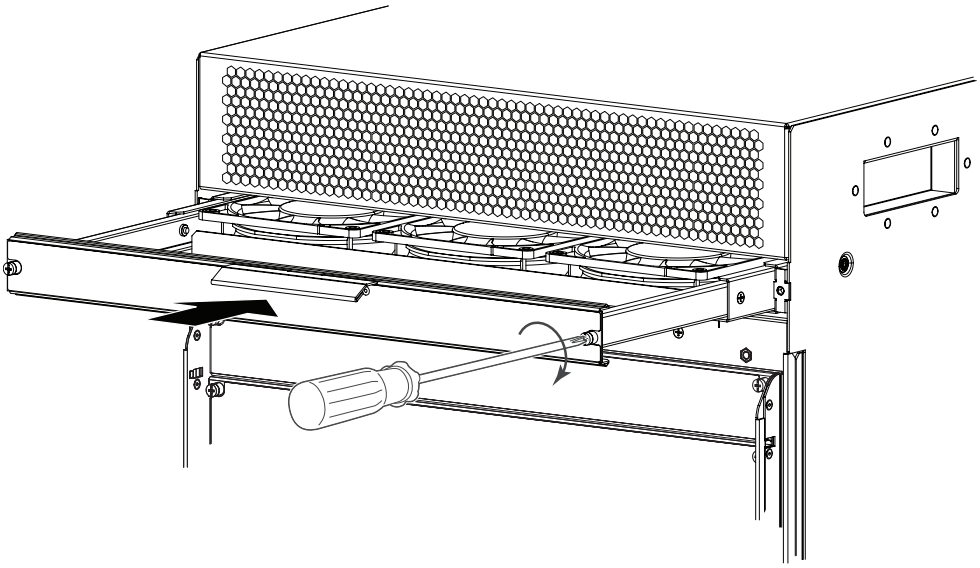


5 Install the replacement fan tray (Figure 71):

a Align the replacement tray with the opening in the chassis, and carefully slide the fan tray into the chassis.

b Align and tighten the captive retaining screw.

Figure 71: Installing the Replacement Fan Tray



Replacing a Chassis Air Filter

Fans in the BlackDiamond 20808 switch draw cooling air in through the lower front of the chassis and exhaust air through vents at the upper back. A replaceable filter immediately below the front fan tray filters air as it enters the chassis.

Required Tools

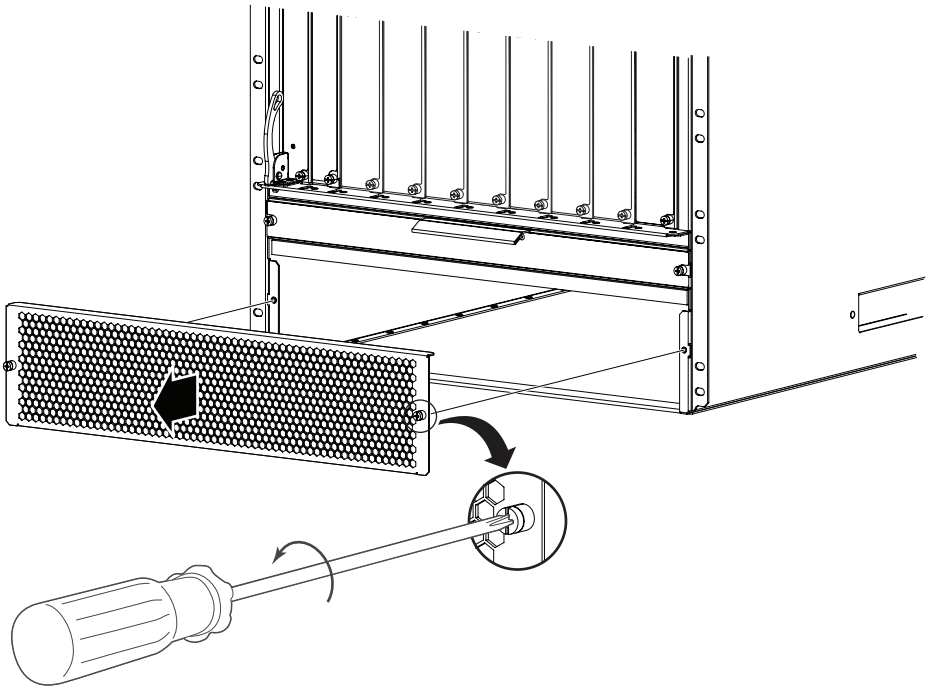
You need a #2 Phillips screwdriver to replace the chassis air filter in the BlackDiamond 20808 switch.

Replacing the Air Filter

To replace the filter:

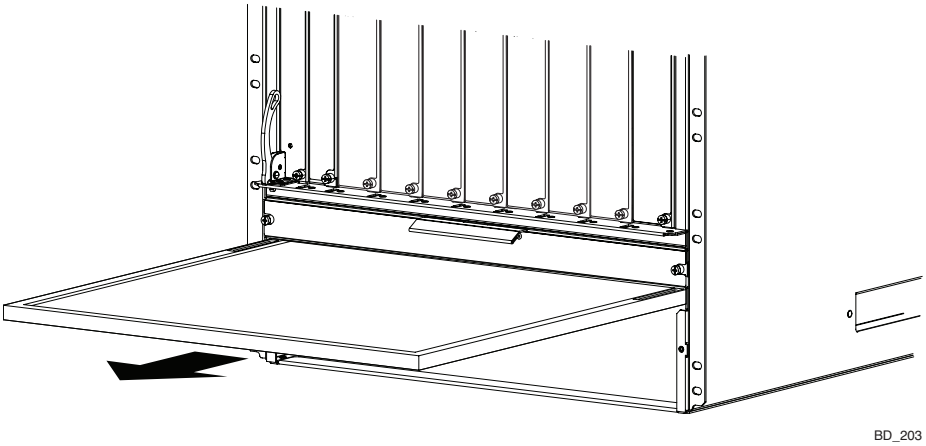
1 At the front of the switch, completely loosen the captive retaining screw at each side of the ventilation panel (Figure 72) and remove the panel from the front of the switch.

Figure 72: Removing the Ventilation Panel



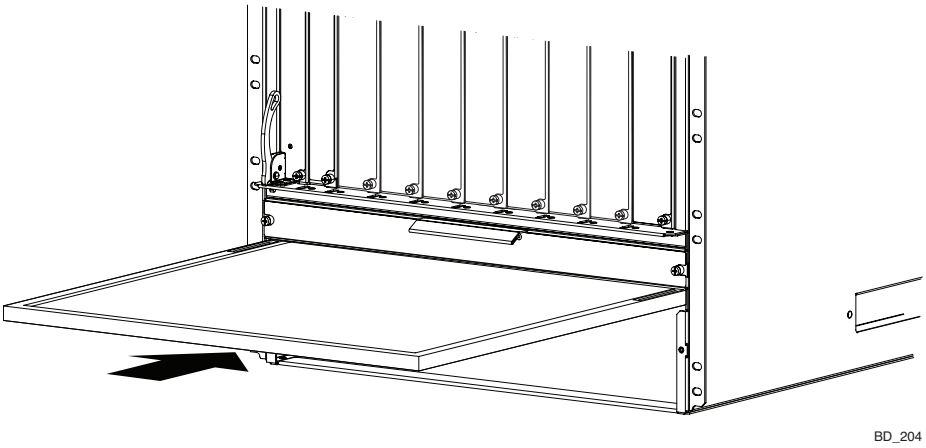
2 Pull the old filter out of the chassis (Figure 73)

Figure 73: Removing the Air Filter



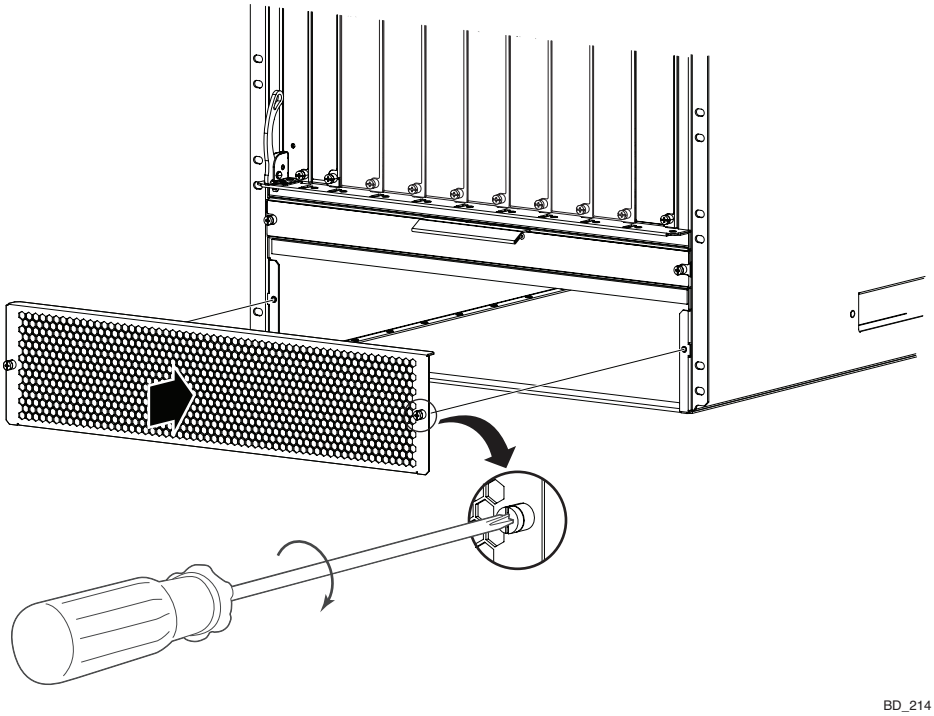
3 Identify the orientation arrows on the top of each side rim of the filter. Holding the filter with the orientation arrows pointing toward the switch, slide the filter into the chassis (Figure 74).

Figure 74: Installing the Air Filter



4 Hold the ventilation panel against the front of the switch chassis. Align and tighten the captive retaining screws (Figure 75).

Figure 75: Reattaching the Ventilation Panel



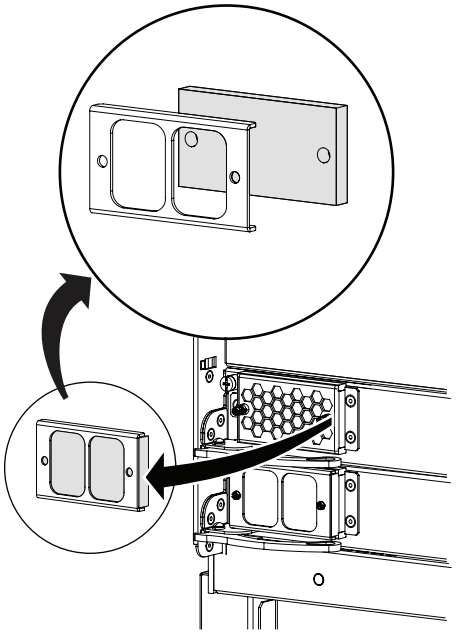
Replacing an Air Filter in an XFM-1 Switch Fabric Module

To replace an XFM-1 air filter:

1 Remove the old filter (Figure 76):

- **a** Pull outward on one side of the filter frame to detach the frame from the mounting post on the module intake vent.
- **b** Pull the other side off the other mounting post.
- **c** Remove the old filter from the frame and discard the old filter.

Figure 76: Removing a Air Filter from an XFM-1 Switch Fabric Module

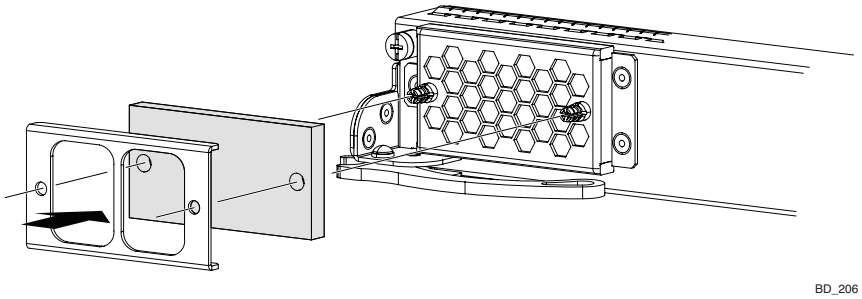


2 Install the new filter (Figure 77):

a Push a new filter over the mounting studs on the air intake vent.

b Set the frame in place over the new filter and push the frame onto the mounting posts.

Figure 77: Installing an XFM Air Filter



Replacing a PSU Air Baffle

Properly installed PSU air baffles prevent the hot PSU exhaust of one system from being drawn into the PSU air intake of an adjacent system, and therefore protect against premature thermal shutdown of the PSU or early power supply failure. For all installations where two or more BlackDiamond 20808 switches are installed next to each other, you must install the PSU air baffles.

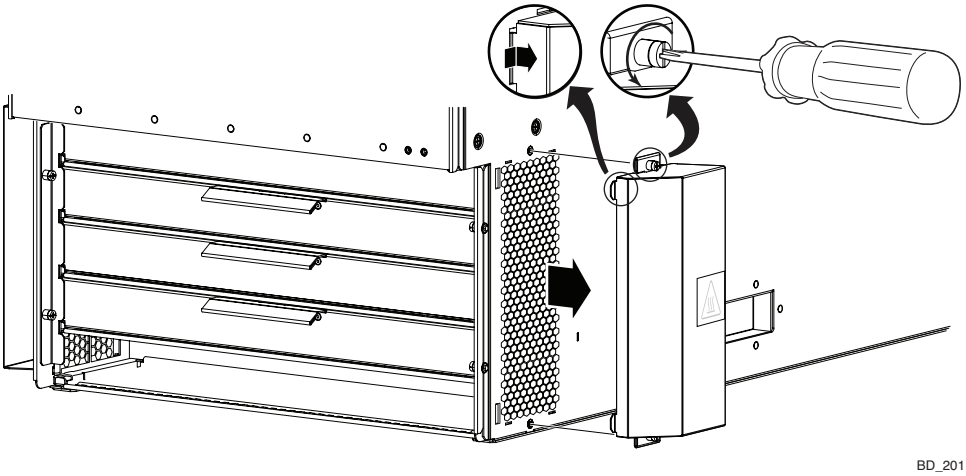
CAUTION

During switch operation, the air baffle on the exhaust side of the PSUs can reach temperatures up to 162° F (72° C). Use thermal protective gloves when you remove air baffles from a functioning switch.

To replace a PSU air baffle:

1 Remove the air baffle from the side of the BlackDiamond 20808 chassis:
   - **a** Use a #2 Phillips screwdriver to completely loosen the captive retaining screws at the top and bottom of the baffle.
   - **b** Slide the baffle toward its open side to disengage the locking tabs.
   - **c** Rotate the open side of the baffle away from the side of the chassis and pull the baffle away from the chassis.

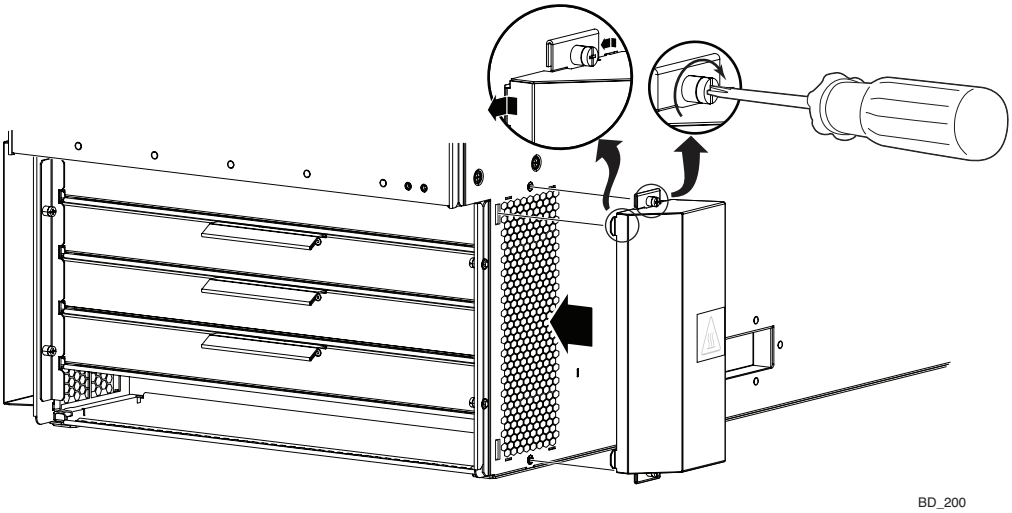
Figure 78: Removing an Air Baffle



2 On the side of the chassis, locate the slots for the top and bottom locking tabs.

3 Install the replacement baffle (Figure 79):
   - **a** Position the baffle over the air intake grill and slip the back edge locator tabs into the chassis slots.
   - **b** Align the top and bottom locking tabs with the small slots above and below the air intake grill, and push the tabs into the slots.
   - **c** Holding the baffle against the side of the chassis, slide the baffle toward the closed side of the baffle to engage the locking tabs.

Figure 79: Installing an Air Baffle



4 Secure the baffle to the chassis using the captive retaining screws at the top and bottom of the baffle.

4 Appendices

A Safety Information

WARNING!

Read the following safety information thoroughly before installing Extreme Networks products. Failure to follow this safety information can lead to personal injury or damage to the equipment.

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.

This appendix includes the following sections:

Considerations Before Installing

Consider the following items before installing equipment.

- The system is designed to operate in a typical Telco environmentally controlled environment, such as a dedicated equipment room, equipment closet, or central office. Choose a site that is:
  - Away from sources of vibration or physical shock.
  - Isolated from strong electromagnetic fields produced by electrical devices.
  - Secured, enclosed, and restricted-access, ensuring that only trained and qualified service personnel have access to the equipment.
- In regions that are susceptible to electrical storms, Extreme Networks recommends that you plug your system into a surge suppressor.
- Install equipment into the lower half of the rack first to avoid making the rack top heavy.
- Establish at least 5 inches clearance on all sides for effective ventilation. Do not obstruct the air intake vent on the front, side, or rear ventilation grills. Locate the system away from heat sources.
- Make sure that your equipment is placed in an area that accommodates the power consumption and component heat dissipation specifications.
- Make sure that your power supplies meet the site power or AC power requirements of the all network equipment.
- The BlackDiamond 20808 switch produces a noise level of 70.6 dBA under normal conditions and a maximum noise level up to 82.4 dBA.

Installing Power Supply Units

For the ratings and power requirements of each power supply unit, see Appendix B, "Technical Specifications,"or the data sheet for the power supply at http://www.extremenetworks.com.

WARNING!

Be sure that the requirements listed in this section are satisfied when installing all Extreme Networks power supplies.

When you install power supplies:

- Plug power supplies only into properly grounded electrical outlets to help prevent electrical shock and comply with international safety standards.
- Use only power cords that are certified for use within the country of use. Do not attempt to modify AC power cords.
- The wall outlet must be installed near the equipment and be easily accessible for quick disconnect.
- Make sure the voltage and frequency of your power outlet match the equipment's system's electrical ratings. The building and/or power source must provide overload protection.
- Use a surge suppressor, line conditioner, or uninterruptible power supply to protect the system from momentary increases or decreases in electrical power.
- For hot-swappable power supplies, do not slam the PSU into the bay.
- If multiple power supplies are used in a switch, connect each power supply to a different, independent power source. If a single power source fails, it will affect only that power supply to which it is connected. If all the power supplies on a single switch are connected to the same power source, the entire switch is vulnerable to a power failure.

WARNING!

Extreme Networks DC PSUs do not have switches for turning the unit on and off. Make sure that the DC circuit is de-energized before connecting or disconnecting the DC power cord at the DC power socket on the Extreme Networks DC PSU.

Wiring an Extreme Networks DC PSU DC power cord to your facility DC source voltage must be performed by a qualified, licensed electrician.

Do not connect the power supply to an electrical outlet when the power supply is outside the chassis; doing so would expose a hazardous energy and poses a potential shock and fire hazard.

Do not put your hand into an open power supply bay when a power supply is not present. Unused power supply bays require an installed PSU blank at all times.

Maintenance Safety

When you perform maintenance procedures on Extreme Networks equipment, follow these recommendations:

- Use only original accessories and/or components approved for use with this system. Failure to observe these instructions may damage the equipment or even violate required safety and EMC regulations.

- There are no customer serviceable components in this system. Repairs to the system must be performed by an Extreme Networks factory service technician.
- To remove power from the system, you must unplug all power cords from wall outlets. The power cord is the disconnect device to the main power source.
- Disconnect all power before removing the back panel of any Extreme Networks switch, unless otherwise instructed by a product specific maintenance procedure.
- Disconnect all power cords before working near power supplies, unless otherwise instructed by a maintenance procedure.
- When handling modules, optic devices, power supplies, or other modular accessories put on the electrostatic discharge (ESD) preventive wrist strap to reduce the risk of electronic damage to the equipment. Leave the ESD-preventive wrist strap permanently attached to the chassis so that it is always available when you need to handle ESD-sensitive components.
- Install all cables in a manner that avoids strain. Use tie wraps or other strain relief devices.
- Replace power cord immediately if it shows any signs of damage.

General Safety Precautions

Follow these guidelines:

- Do not try to lift objects that you think are too heavy for you.
- When installing equipment in a rack, load the heavier devices in the lowest portions of the rack to avoid a top-heavy hazard.
- Only use tools and equipment that are in perfect condition. Do not use equipment with visible damage.
- Routing cables: Lay cables so as to prevent any risk of these cables being damaged or causing accidents, such as tripping.

Cable Routing for LAN Systems

The BlackDiamond 20808 switch meets the requirements for LAN system equipment. LAN systems are designed for intra-building installations; that is, cable runs between devices must be in the same building as the connected units.

This equipment can be connected between buildings if any *one* of the following conditions is true:

- Cable runs between buildings are less then 140 feet long.
- Cable runs between buildings are directly buried.
- Cable runs between buildings are in an underground conduit, where a continuous metallic cable shield or a continuous metallic conduit containing the cable is bonded to each building grounding electrode system.

CAUTION

Failure to follow these requirements for cable routing conditions may expose the user to electrical shock and expose the unit to errors or damage.

Selecting Power Supply Cords

Extreme Networks offers selected power input cords for the 2400 W AC PSU. Consult your sales representative for more information about these.

The power input cord must meet the following requirements:

- Is agency-certified for the country of use and rated for 200-240 V AC.
- Has an IEC 320 C19 connector for connection to the PSU.
- Has an appropriately rated and approved wall plug applicable to the country of installation.
- Is less than 3 meters (10 feet) long.
- Has a minimum wire size of 14 AWG (1.5 mm^2) copper-stranded.

Power supply cords for use outside of the United States and Canada are typically provided separately by third-party distribution centers. Contact the Extreme Networks TAC for questions regarding the proper selection of a power input cord for your specific switch.

WARNING!

When using multiple power supplies, make sure that each power supply is attached to an independent circuit breaker. See PS installation instructions of PS for proper sizing of circuit breaker.

Make sure that the source outlet is properly grounded according to the country's local electrical requirements before plugging the AC supply power cord into a PSU.

For specific product input power requirements refer to the data sheet of PSU at http://www.extremenetworks.com or to Appendix B of this guide.

The following countries have specific safety instructions concerning power connectors:

- Argentina: The supply plug must comply with Argentinean standards.
- Australia: Use AS 3112 for 220 VAC power supplies.
- Denmark: The supply plug must comply with section 107-2-D1, standard DK2-1a or DK2-5a.
- International: Use CEE 7/7 for 220 VAC power supplies.
- Japan:
  - Use JIS 8303 for 220 VAC power supplies.
  - The power cord provided with the power supply, switch, or chassis is for use only with that specific product from Extreme Networks; it is not for use with any other product from Extreme Networks or any other vendors' equipment.
- North America: The cord set must be cULus listed or cCSAus listed.
- Switzerland: The supply plug must comply with SEV/ASE 1011.
- United Kingdom: Use BS 1363 for 220 VAC power supplies.

NOTE

This equipment is not intended to be directly powered by power distribution systems where phase-phase voltages exceed 240V AC (2P+PE), such as those used in Norway, France, and other countries. For these applications it is recommended that a transformer be used to step down the voltage to < 240V AC from phase-phase, or that you make a connection to a (P+N+PE) power distribution where voltages do not exceed 240V AC.

All installations should confirm that the product is reliably grounded according to the country's local electrical codes.

NOTE

Building codes vary worldwide; therefore, Extreme Networks strongly recommends that you consult an electrical contractor to ensure proper equipment grounding and power distribution for your specific installation & country.

Battery Replacement and Disposal

Batteries included with Extreme products are encapsulated and must be replaced by qualified Extreme Service personnel only. Contact your Extreme Service personnel for product replacement. Do not attempt to replace the battery. If these instructions are disregarded and replacement of these batteries is attempted, the following guidelines must be followed to avoid danger of explosion:

- Replace the battery with the same or equivalent battery type as recommended by the battery manufacturer.
- Dispose of the battery in accordance with the battery manufacturer's recommendation.

Fiber Optic Ports—Optical Safety

The following safety warnings apply to all optical devices used in Extreme Networks equipment that are removable or directly installed in an I/O module or chassis system. Such devices include but are not limited to gigabit interface converters (GBICs), small form factor pluggable (SFP) modules (or mini-GBICs), XENPAK transceivers, and XFP laser optic modules.

WARNING!

Laser optic modules become very hot after prolonged use. Take care when removing a laser optic module from the chassis or option card. If the laser optic module is too hot to touch, disengage the laser optic module and allow it to cool before removing it completely.

Only trained service personnel should perform service to Extreme Networks switches and their components. Trained service personnel have read all related installation manuals, have the technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task, and are aware of measures to minimize the danger to themselves or other persons.

WARNING!

When working with laser optic modules, always take the following precautions to prevent exposure to hazardous radiation:

- *Never look at the transmit LED/laser through a magnifying device while it is powered on.*
- *Never look directly at a fiber port on the switch or at the ends of a fiber cable when they are powered on.*
- *Invisible laser radiation can occur when the connectors are open. Avoid direct eye exposure to the beam when optical connections are unplugged.*
- *Never alter, modify, or change an optical device in any way other than suggested in this document.*

GBIC, SFP (Mini-GBIC), XENPAK, and XFP Regulatory Compliance

- Class 1 Laser Product
- EN60825-1+A2:2001 or later, European laser standard
- FCC 21 CFR Chapter 1, Subchapter J in accordance with FDA & CDRH requirements
- Application of CE Mark in accordance with 2004/108/EC EMC and 93/68/EEC Low Voltage Directives
- UL and/or CSA registered component for North America
- 47 CFR Part 15, Class A when installed into Extreme products

NOTE

Extreme Networks optical modules are tested to work in all supported Extreme Networks switches. We recommend that all customers use Extreme Networks optical modules in their Extreme Networks switches. Extreme Networks assumes no liability for third-party optical modules. Although Extreme Networks does not block third-party optical modules, we cannot ensure that all third-party optical modules operate properly in all Extreme Networks switches. The customer assumes all risks associated with using third-party optical modules in Extreme Networks switches.

Sicherheitshinweise

WARNUNG!

Vor der Installation der Produkte von Extreme Networks sind die nachfolgenden Sicherheitshinweise aufmerksam zu lesen. Die Nichtbeachtung dieser Sicherheitshinweise kann zu Verletzungen oder Schäden an der Ausrüstung führen.

Installation, Wartung und Ausbau eines Switch, einer Grundplatte oder einer seiner Komponenten dürfen nur von geschultem und qualifiziertem Servicepersonal durchgeführt werden! Geschulte und qualifizierte Servicetechniker verfügen über die erforderliche technische Ausbildung und Erfahrung, um mögliche Gefahren bei der Durchführung von Servicearbeiten zu erkennen und Maßnahmen zur Minimierung der Gefahr für sich bzw. andere zu treffen.

Hinweise zur Installation

WARNUNG!

Beachten Sie vor der Installation der Ausrüstung folgende Punkte.

Stellen Sie sicher, dass die nachfolgend aufgeführten Bedingungen erfüllt sind:

- Das System ist für den Einsatz in einer typischen Umgebung gemäß Telco-Vorgaben vorgesehen. Wählen Sie einen Aufstellort mit den folgenden Eigenschaften:
  - Ausreichender Abstand zu Quellen, die Erschütterungen oder Schläge/Stöße hervorrufen können
  - Isolierung von starken elektromagnetischen Feldern, wie sie durch Elektrogeräte erzeugt werden
  - Sicherer, abgeschlossener Arbeitsbereich mit beschränktem Zugang, sodass nur geschultes und qualifiziertes Servicepersonal Zugriff auf das Gerät hat
  - In für elektrische Stürme anfälligen Gebieten wird empfohlen, das System an einen Spannungsstoßunterdrücker anzuschließen.
  - Die Ausrüstung im unteren Teil des Gestells installieren, um zu vermeiden, dass der obere Teil des Gestells zu schwer wird.
  - Auf allen Seiten für mindestens 12,7 cm (5") Abstand sorgen, um eine ausreichende Belüftung zu gewährleisten. Die Lufteinlassöffnung an den vorderen, seitlichen und hinteren Entlüftungsgittern nicht blockieren. Das System nicht in der Nähe von Wärmequellen aufstellen.
- Sicherstellen, dass die Ausrüstung in einem Bereich aufgestellt wird, der den Spezifikationen für Leistungsaufnahme und Wärmeabstrahlung der Komponenten entspricht.
- Sicherstellen, dass Ihre Netzteile die Anforderungen an die Strom- oder Wechselstromversorgung vor Ort für alle Netzwerkgeräte erfüllen.
- Bei den Extreme-Produkten handelt es sich um digitale Geräte der Klasse A gemäß Teil 15 der FCC-Richtlinien und anderen internationalen Richtlinien. Der Gerätebetrieb unterliegt den folgenden Voraussetzungen: (1) Das Gerät kann schädliche Interferenzen verursachen, und (2) das Gerät muss jede empfangene Interferenz zulassen, einschließlich einer Interferenz, die einen unerwünschten Betrieb verursachen kann.
- Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 82.4 dB(A) gemäss EN ISO 7779.

Installation von Netzteilen

WARNUNG!

Bei der Installation sämtlicher Netzteile von Extreme Networks muss sichergestellt werden, dass die nachfolgend aufgeführten Anforderungen erfüllt sind. Angaben zu Nennleistung und Leistungsbedarf finden sich in den Installationsanweisungen für das jeweilige Netzteil (Power Supply Unit, PSU).

Folgende Anforderungen müssen unbedingt erfüllt sein:

- Wenn der mit Wechsel- oder Gleichstrom betriebene Switch von Extreme Networks mit einem externen grünen/gelben Erdungskabel ausgestattet ist, dann muss zunächst dieses Erdungskabel zwischen der Grundplatte und einem geeigneten Erdungspunkt angeschlossen werden, bevor andere Verbindungen zum Gerät hergestellt werden; dies gilt auch für den Anschluss an das Wechsel- bzw. Gleichstromnetz. Beim Ausbau des Geräts aus dem Gestell muss das Erdungskabel als letztes getrennt werden.
- Netzteile nur an vorschriftsmäßig geerdete Steckdosen anschließen, um die Gefahr elektrischer Schläge zu vermeiden und die Konformität mit internationalen Sicherheitsnormen zu gewährleisten.
- Nur Stromkabel verwenden, die für den Einsatz in dem jeweiligen Land zugelassen sind. Wechselstromkabel dürfen nicht manipuliert werden.
- Die Wandsteckdose muss in der Nähe der Anlage installiert und leicht zugänglich sein, um eine schnelle Trennung vom Netz zu ermöglichen.
- Spannung und Frequenz der Steckdose müssen den elektrischen Nenndaten des Systems entsprechen. Das Gebäude bzw. die Stromquelle muss mit einem Überlastschutz ausgestattet sein.
- Einen Spannungsstoßunterdrücker, einen Netzfilter oder eine unterbrechungsfreie Stromversorgung verwenden, um das System vor einer vorübergehenden Zu- oder Abnahme der elektrischen Leistung zu schützen.
- Bei laufendem Betrieb austauschbare Netzteile: Das Netzteil vorsichtig, nicht mit Kraft in das Aufnahmefach einsetzen.
- Bei Einsatz mehrer Netzteile in einem Switch sind die Netzteile jeweils an unterschiedliche, unabhängige Stromquellen anzuschließen. Auf diese Weise ist bei einem Ausfall einer einzelnen Stromquelle nur das daran angeschlossene Netzteil betroffen. Wenn alle Netzteile eines einzelnen Switch an dieselbe Stromquelle angeschlossen sind, ist der gesamte Switch für einen Ausfall der Stromversorgung anfällig.

Leistungsspezifikationen für Netzteile von Extreme Networks finden sich in Anhang B dieses Dokuments oder im Netzteil-Datenblatt unter http://www.extremenetworks.com.

WARNUNG!

Die 325 W DC-Netzteile von Extreme Networks sind nicht mit Ein-/Ausschaltern ausgestattet. Vor dem Einstecken des Gleichstromkabels in den Gleichstromanschluss des 325 W DC-Netzteils von Extreme Networks sowie vor dem Abziehen des Kabels sicherstellen, dass der Gleichstromkreis abgeschaltet ist.

Das Gleichstromkabel des 325 W DC-Netzteils muss von einem qualifizierten, zugelassenen Elektriker an die Gleichspannungsquelle in Ihrem Gebäude angeschlossen werden.

Extreme Networks 325 W AC Netzteile haben keinen An- Aus Schalter. Die Stromzufuhr zu einem Extreme Networks 325 W AC Netzteil wird durch das Ziehen des Netzkabels unterbrochen. Es ist sicherzustellen das diese Verbindung leicht zugänglich ist.

Das Netzteil nicht ausserhalb von dem Gehäuse an das Netz anschliessen da hierdurch gefährliche Spannungen

zugänglich werden sowie die Gefahr von einem elektrischem Schlag und/ oder Feuergefahr besteht.

Nicht die Hand in den Netzteilschacht einführen wenn das Netzteil entfernt ist. Leere Netzteilschächte müssen immer mit eine Abdeckplatte bedeckt sein.

Wartungssicherheit

Folgende Vorsichtsmaßnahmen müssen getroffen werden:

- Nur für den Einsatz mit diesem System zugelassene Originalzubehörteile bzw. -komponenten verwenden. Die Nichtbeachtung dieser Anweisungen kann zu Schäden an der Ausrüstung oder sogar zu einem Verstoß gegen die erforderlichen Sicherheitsbestimmungen und EMV-Vorschriften führen.
- Die Abdeckung der Grundplatte darf nur durch Personal von Extreme Networks entfernt werden. Das System enthält keine vom Kunden zu wartenden Komponenten. Reparaturen am System sind von einem Werkstechniker von Extreme Networks durchzuführen.
- Der An-/Aus-Schalter des Systems darf nicht die gesamte Stromversorgung zum System unterbrechen. Zur Unterbrechung der Wechselstromversorgung zum System müssen alle Stromkabel aus den Wandsteckdosen gezogen werden. Das Stromkabel dient zur Trennung von der Netzstromversorgung.
- Vor dem Entfernen der Rückwand eines Extreme Networks-Switch muss die gesamte Stromzufuhr unterbrochen werden.
- Vor der Aufnahme von Arbeiten in der Nähe von Stromquellen alle Stromkabel abziehen, sofern nicht im Rahmen eines Wartungsverfahrens anders vorgegeben.
- Beim Umgang mit Modulen, optischen Geräten, Netzteilen oder anderen modularen Zubehörteilen das ESD-Schutzarmband anlegen, um das Risiko einer Beschädigung der Geräte durch elektrostatische Entladungen zu verringern. Das Armband zum Schutz elektrostatisch gefährdeter Bauteile (ESB) grundsätzlich an der Grundplatte befestigt lassen, damit es beim Umgang mit diesen Bauteilen immer zur Hand ist.
- Alle Kabel so verlegen, dass übermäßige Belastungen vermieden werden. Kabelbinder oder Zugentlastungsklemmen verwenden.
- Ein Stromkabel bei Anzeichen von Beschädigungen unverzüglich austauschen.

Allgemeine Sicherheitsvorkehrungen

Folgende Richtlinien sind unbedingt zu befolgen:

- Keine Gegenstände heben, die möglicherweise zu schwer sind.
- Bei einer Installation in einem Gestell darauf achten, dass schwere Geräte unten im Gestell eingebaut werden, um Gefahren durch Umkippen zu vermeiden.
- Nur Werkzeuge und Ausrüstung verwenden, die sich in einwandfreiem Zustand befinden. Keine Ausrüstung verwenden, die sichtbare Beschädigungen aufweist.
- Schutz ESD-gefährdeter Bauteile: Zum Schutz ESD-gefährdeter Bauteile grundsätzlich vor der Aufnahme von Arbeiten an Leiterplatten oder Modulen ein Armband anlegen. Leiterplatten nur in antistatischer Verpackung transportieren. Vor der Aufnahme von Arbeiten an Leiterplatten diese immer auf einer geerdeten Fläche ablegen.
- Verlegen von Kabeln: Kabel so verlegen, dass keine Schäden entstehen oder Unfälle, z. B. durch Stolpern, verursacht werden können.

Auswahl der Stromkabel

Je nachdem, welchen Switch Sie erworben haben, werden die Wechselstromnetzteile von Extreme Networks entweder nur mit einem 110-VAC-Kabel oder mit einem 110-VAC-Kabel und einem 208/220-VAC-Kabel geliefert. Die von Extreme Networks gelieferten Stromkabel sind nur für den Einsatz in den Vereinigten Staaten und Kanada ausgelegt und zugelassen. Stromkabel für den Einsatz außerhalb der Vereinigten Staaten und Kanada werden normalerweise von einem Drittanbieter geliefert und müssen die folgenden Anforderungen erfüllen:

- Die Stromkabel müssen offiziell für das Land zugelassen sein, in dem sie verwendet werden sollen.
- Die Stromkabel müssen mit einem für das Einsatzland zugelassenen Wandsteckkontakt mit der geeigneten Nennleistung ausgerüstet sein.
- Die Konfiguration der Steckvorrichtung (die Steckverbindung zur Einheit, nicht zur Wandsteckdose) muss für eine Gerätesteckdose gemäß EN60320/IEC320-C14 ausgeführt sein.
- Die Länge der Stromkabel muss weniger als 5 m (15 Fuß) betragen.
- Die Mindestspezifikation für das flexible Kabel lautet:
  - Nr. 18 AWG (0,823 mm2) für Einheiten mit einem Bemessungsstrom von weniger als 10 A, oder
  - Nr. 18 AWG (0,823 mm2) bis 2 m Länge für Einheiten mit einem Bemessungsstrom von 10 A oder höher, oder
  - Nr. 16 AWG (1,0 mm2) bis 5 m Länge für Einheiten mit einem Bemessungsstrom von 10 A oder höher
- Bei allen Kabeln muss es sich um 3-adrige Kupferleiter vom Typ SVT oder SJT, HAR oder einen äquivalenten Typ handeln.

Verwenden Sie immer ein Wechselstromkabel, das den Vorschriften Ihres Landes entspricht. Erkundigen Sie sich über die örtlichen Vorschriften für Elektroinstallationen und fragen Sie bei den zuständigen Aufsichtsbehörden nach den Anforderungen an Stromkabel. Nähere Angaben zu den Leistungsspezifikationen von Netzteilen finden sich unter http://www.extremenetworks.com oder in Anhang B dieses Dokuments.

WARNUNG!

Vor dem Anschließen des Wechselstromkabels an ein Netzteil muss sichergestellt werden, dass die Steckdose vorschriftsgemäß geerdet ist.

Für die unten aufgeführten Länder gelten zusätzlich folgende Anforderungen:

- Argentinien: Der Netzstecker muss den argentinischen Standards entsprechen.
- Australien: Versorgungssteckdose, 15 A Minimum, AS 3112 für 110/220-VAC-Netzteile
- Dänemark: Der Netzstecker muss die in Abschnitt 107-2-D1 der Norm DK2-1a oder DK2-5a aufgeführten Bestimmungen erfüllen.
- Japan:
  - Versorgungssteckdose, 15 A, JIS 8303 für 110/220-VAC-Netzteile.
  - Das mit dem Netzteil, dem Switch oder der Grundplatte gelieferte Verbindungskabel ist nur für den Einsatz mit dem spezifischen Produkt von Extreme Networks vorgesehen und darf nicht mit anderen Geräten von Extreme Networks oder anderen Anbietern verwendet werden.
- Nordamerika: Versorgungssteckdose, 15 A, NEMA 5-15 für 110-VAC-Netzteile und NEMA L6-15P für 208/220-VAC-Netzteile

- Schweiz: Der Netzstecker muss der Richtlinie SEV/ASE 1011 entsprechen.
- Großbritannien: Versorgungssteckdose, 15 A, BS 1363 für 110/220-VAC-Netzteile
- International: Versorgungssteckdose, 15 A, CEE 7/7 für 110/220-VAC-Netzteile
- Nur Frankreich und Peru:

  Diese Einheit kann nicht über IT†-Netzteile mit Strom versorgt werden. Wenn Ihre Netzteile vom Typ IT sind, muss dieses Gerät mit 230 V (2P+T) unter Verwendung eines Trenntrafos mit einem Verhältnis von 1:1 versorgt werden. Der zweite Anschlusspunkt muss als neutral definiert und direkt an die Erde angeschlossen werden.

Hinweis: Die Bauvorschriften sind weltweit verschieden; Extreme Networks empfiehlt daher ausdrücklich, einen Elektroinstallateur zu beauftragen, um die sachgemäße Geräteerdung und Stromverteilung für Ihre spezifische Installation sicherzustellen.

Austauschen und Entsorgen von Batterien

Im Umgang mit Batterien sind folgende Hinweise zu beachten:

- Austauschen der Lithium-Batterie: Die in diesem Gerät enthaltenen Batterien können nicht vom Anwender ausgetauscht werden. Wenden Sie sich für einen Austausch des kompletten Gerätes bitte an die Servicemitarbeiter von Extreme. Sollte der Versuch eines Austausches unternommen werden, sind zur Vermeidung einer Explosionsgefahr folgende Richtlinien zu beachten:
  - **a** Die Batterie nur durch eine identische oder eine gleichwertige, vom Hersteller empfohlene Batterie ersetzen.
  - **b** Die Batterie gemäß den Empfehlungen des Herstellers entsorgen.

Lichtleiteranschlüsse: Optische Sicherheit

WARNUNG!

Beim Umgang mit Lichtleitermodulen sind folgende Vorsichtsmaßnahmen zu beachten:

- *Niemals durch ein Vergrößerungsgerät auf die übertragende LED/den Laser schauen, wenn diese(r) eingeschaltet ist.*
- *Niemals direkt auf einen Lichtleiteranschluss am Switch oder auf die Enden eines Faserkabels schauen, wenn diese eingeschaltet sind.*
- *Bei offenen Anschlüssen kann es zu unsichtbarer Laserstrahlung kommen. Direkter Augenkontakt mit dem Strahl ist zu vermeiden.*
- *Ein optisches Gerät niemals auf andere Weise verändern oder modifizieren als in diesem Dokument angegeben.*

Einhaltung behördlicher Vorschriften durch GBIC, Mini-GBIC, XENPAK und XFP

- Laserprodukt der Klasse 1
- EN60825-1+A2:2001 oder jünger, Europäische Richtlinie für Lasersysteme
- Anwendung der CE-Kennzeichnung gemäß der Richtlinien 89/336/EWG EMV und 73/23/EWG für Niederspannungsgeräte

B Technical Specifications

This appendix contains the following specifications:

BlackDiamond 20808 Switch Specifications

Table 11: BlackDiamond 20808 Switch Technical Specifications

Physical Dimensions	
BlackDiamond 20808 chassis	Height: 25.33 inches (64.34 cm) Width (without rack-mounting brackets): 17.55 inches (44.58 cm) Width (with rack-mounting brackets): 17.70 inches (44.96 cm) Depth (including fan covers): 28.9 inches (73.3 cm)
Weight	
BlackDiamond 20808 chassis (as shipped)	165 lb (74.8 kg)
BlackDiamond 20808 chassis (fully loaded)	307.5 lb (139.5 kg)
BlackDiamond 20808 fan tray	12.25 lb (5.55 kg)
2400 W AC Power Supply	6 lb (2.72 kg)
1900 W DC Power Supply	6 lb (2.72 kg)
MM-Base management module	6.5 lb (2.95 kg)
MM-Adv management module	9.5 lb (4.31 kg)
XM-8XB I/O module	13 lb (5.9 kg)
GM-40XB I/O module	7.25 lb (3.3 kg)
GM-40XA I/O module	7.25 lb (3.3 kg)
XFM-1 switch fabric module	4.25 lb (1.93 kg)
Safety Standards	
North American Safety of ITE	UL 60950-1:2003 1st Ed., Listed Device (US) CSA 22.2#60950-1-03 1st Ed.(Canada) Complies with FCC 21CFR Chapter1, Subchapter (US Laser Safety) CDRH Letter of Approval (US FDA Approval) NOM/NYCE (Mexico) IEEE 802.3af 6-2003 Environment A for PoE Applications
European Safety of ITE	EN 60950-1:2001 (GS Mark) EN 60825-1+A2:2001 (Lasers Safety) 73/23/EEC Low Voltage Directive
International Safety of ITE	CB Report & Certificate per IEC 60950-1:2001 + All Country Difference AS/NZX 60950-1 (Australia /New Zealand)

Table 11: BlackDiamond 20808 Switch Technical Specifications (Continued)

EMI/EMC Standards	
North America EMC for ITE	FCC CFR 47 part 15 Class A (USA) 07/10/08; ICES-003 issue 4, 2004-02 (Canada) 108/EC (December 2004) EU EMC directive NEBS GR-1089-Core Issue4, 2006
European EMC standards	EN 55022:2006 Class A EN 55024:2006 EN 61000-3-2 v2.1 2001-10 (Harmonics) EN 61000-3-3 v1.1 2002-03 (Flicker) ETSI EN 300 386 V1.4.1 2008-02 (EMC Telecommunications)
International EMC certifications	CISPR 22:2006 Class A (International Emissions) CISPR 24 A2:2002 (International Immunity); IEC/EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15kV Air, Criteria A, 1995, Am.1998-01 IEC/EN 61000-4-3 Radiated Immunity 10V/m, Criteria A, 1996-09, Am 1,2 2002; IEC/EN 61000-4-4 Transient Burst, 1kV, Criteria A, 2004 IEC/EN 61000-4-5 Surge, 2kV, 4kV, Criteria A, 2006 IEC/EN 61000-4-6 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A, 2007 IEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C, 2004
Country-specific	VCCI Class A (Japan Emissions), identical to CISPR 22 ACA (Australia Emissions & Safety) CNS 13438:1997 Class A (BSMI-Taiwan) MIC Mark, KN-24 2005, EMC Approval (North Korea) ANATEL, Resolution 237, 238 & 242 (Brazil) In process NOM/NYCE (Mexico)
Telecom Standards	ETSI EN 300 386:2001 (EMC Telecommunications) ETSI EN 300 019 (Environmental for Telecommunications)
IEEE 802.3 Media Access Standards Note: These standards are module-specific and may not apply to every module in the series.	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX, 100BASE-FX IEEE 802.3z 1000BASE-X IEEE 802.3ab 1000BASE-T IEEE 802.3ac VLAN Tag IEEE 802.3ad Link Aggregation IEEE 802.3ae 10GBASE-X IEEE 802.3aef Power over Ethernet
Environmental Data	
Environmental Standards	EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage V2.2.2 (2004) EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation V2.2.2 (2004) EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational V2.2.2 (2004) EN/ETSI 300 753 (1997-10) - Acoustic Noise NEBS GR-63-Core, Issue 2, 2002-04 - Sound Pressure 1.5G ASTM D3580 Random Vibration Unpackaged 1.5G
Operating conditions	Operating temperature range: 0° C to 40° C (32° F to 104° F)* Operating humidity:10% to 95% relative humidity, non-condensing Operating altitude 0 to 3000 meters (0 to 9,850 ft) Operational shock: 30 m/s^2 (3 g), 11 ms, 60 shocks Operational random vibration: 5 to 500 Hz @ 1.5g rms

Table 11: BlackDiamond 20808 Switch Technical Specifications (Continued)

Storage & Transportation Conditions (Packaged)	Transportation temperature: –40° C to 70° C (–40° F to 158° F) Storage and transportation humidity: 10% to 93% relative humidity, non-condensing Packaged shock (half sine): <50 kg 180 m/s^2 (10 g), 6 ms, 600 shocks, modules >50 kg 100 m/s^2 (6 g), 11 ms, 600 shocks, chassis Packaged random vibration: 5 to 20 Hz @ 1.0 ASD w/–3 dB/oct. from 20 to 200 Hz Packaged sinusoidal vibration: 5 to 62 Hz, 5 mm/s velocity, 62 to 200 Hz, 0.2 g Tilt: 22.5 degrees and return to position 14 drops minimum on sides & corners @ 39.4" <20 lb (9 kg) modules @ 19.7" <80 lb (36 kg) chassis

Acoustic Sound (BlackDiamond 20808 switch with AC Power Supplies)

Sound power in accordance with EN 300 753 (10-1997)	Sound power Normal: 70.6 dBA per ISO 7779 High: 75.1 dBA per ISO 7779 Maximum: 82.4 per ISO 7779 Declared sound power Normal: 7.2 belsA per ISO 7779 & ISO 9296 High: 7.6 belsA per ISO 7779 & ISO 9296
Sound pressure in accordance with NEBS GR-63 Issue 2	Bystander sound pressure Normal: 64 dBA front side @ 0.6m High: 66 dBA left side @ 0.6m

* Short-term operation is permitted at –5°C to 0°C and 40°C to 55°C, for no more than 96 consecutive hours and a total of not more than 15 days in 1 year.

Power Supply Specifications

Table 12: Specifications for the 2400 W AC Power Supply

Minimum configuration	1 power supply
Maximum configuration	5 power supplies
Input	Nominal input: 200 to 240 V ~ , 50/60 Hz, 13 A max AC voltage input range: 180 to 264 V ~ Maximum input amperages: 10 A @ 264 V ~ (high-line) 13 A @ 180 V ~ (low-line) AC line frequency: 47 to 63 Hz
Output	DC output: 48 V ⎓ , 50 A/12 V ⎓ , 1.2 A DC output power (W): 2413 W
Power supply cord selection	Refer to "Selecting Power Supply Cords" on page 116.
AC power supply input socket	IEC 320 C19
Minimum wire size	14 AWG (2.06 mm^2) copper stranded (pre-approved cord set for county of use)

Table 12: Specifications for the 2400 W AC Power Supply (Continued)

Operating conditions	Operating temperature*: 0° C to 40° C Storage temperature: –40° C to 70° C Operating humidity: 10% to 95% relative humidity, non-condensing Operating altitude: 0 – 10,000 ft (0 – 3,000 m) at 40° C Operational shock: 30 m/s^2 (3 g)

Table 13: Specifications for the 1900 W DC Power Supply

Minimum configuration	1 power supply
Maximum configuration	5 power supplies
Input	Nominal input voltage: 48 V ⎓ , 44 A DC voltage input range: 40 V ⎓ to 72 V ⎓ Maximum Input Amperages: 53 A @ 40 V V ⎓ 44 A @ 48 V ⎓ 30 A @ 72 V ⎓
Output	DC output: 48 V ⎓ , 40 A/12 V ⎓ , 1.2 A DC output power (W): 1934 W
Minimum wire size	6 AWG (13.3 mm^2) copper stranded
Operating conditions	Operating temperature*: 0° C to 40° C (32° F to 104 °F) Operating humidity: 10% to 95% relative humidity, non-condensing Operating altitude: 0 – 10,000 ft (0 – 3,000 m) at 40° C Operational shock: 30 m/s^2 (3 g)

Connector Pinouts

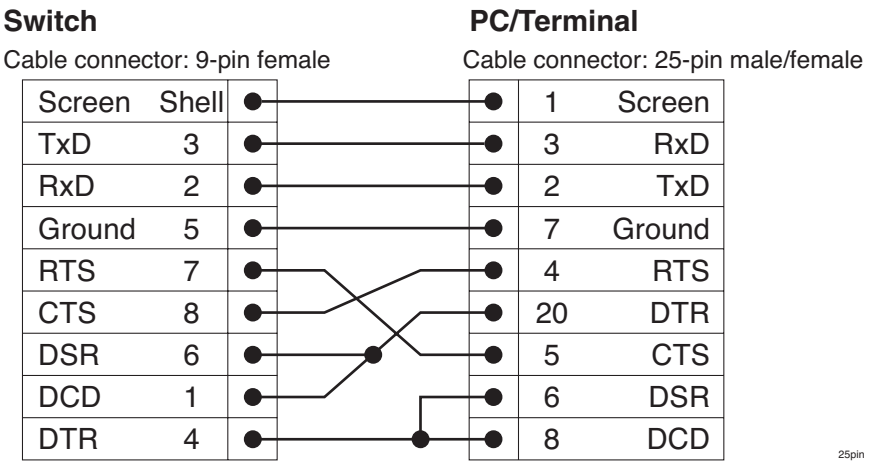
Table 14 describes the pinouts for a DB-9 console plug connector

Table 14: Pinouts for the DB-9 Console Connector

Function	Pin Number	Direction
DCD (data carrier detect)	1	In
RXD (receive data)	2	In
TXD (transmit data)	3	Out
DTR (data terminal ready)	4	Out
GND (ground)	5	-
DSR (data set ready)	6	In
RTS (request to send)	7	Out
CTS (clear to send)	8	In

Figure 80 shows the pinouts for a 9-pin to 25-pin (RS-232) null-modem cable.

Figure 80: Null-modem Cable Pinouts



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